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THE AMERICAN SPECIES OF *TRIUMFETTA* L.<sup>1</sup>

KO KO LAY<sup>2</sup>

INTRODUCTION

The genus *Triumfetta*, one of the largest of the Tiliaceae, is pantropic in its distribution; the total number of valid species in the genus may approximate 150 or more. Species are especially abundant in Latin America, but extend from tropical Florida through the West Indies, Mexico, and Central America, southward to Argentina.

The western-hemisphere species of the genus have received no special attention from systematists. K. Schumann's<sup>3</sup> treatment of the South American species, though still a standard reference, is however pathetically out of date. Standley's<sup>4</sup> classification of the Mexican species is generally more acceptable, but an array of new species has been established since his publication. About 150 species have been named for this hemisphere, and it was thought desirable to monograph the genus for the New World in order to establish the proper status of the species.

It is realized that the present splitting of the genus with regard to its occurrence in the eastern and western hemispheres, though convenient, is definitely not natural. At least three species which are represented in Latin America are also known to occur in the eastern hemisphere. There is a possibility that other species may have similar distribution. Since this study was undertaken with a view to clarify the species of the western hemisphere, the total range and the remaining species of the genus have of necessity been ignored.

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<sup>1</sup>An investigation carried out in the graduate laboratory of the Henry Shaw School of Botany of Washington University and submitted as a thesis in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Washington University.

<sup>2</sup>Lecturer in Botany, University of Rangoon, Burma. Formerly Burma State Scholar in the Henry Shaw School of Botany of Washington University.

<sup>3</sup>K. Schumann, in Mart. Fl. Bras. 12<sup>3</sup>:131. 1886.

<sup>4</sup>Standley, in Contr. U. S. Nat. Herb. 23<sup>3</sup>:741. 1923.



A large quantity of specimens from nearly all the major herbaria of Europe and of both North and South America has been available for the study. About fifty plants of three species were also grown in a greenhouse, but the living plants were not amenable to such conditions and though they grew steadily none flowered. Hence this study is based entirely on the standard herbarium methods.

In trying to understand the morphology and to clarify the basic species concept in the genus, I realized, as with some previous systematists,<sup>5, 6</sup> that the characters derived from the fruits are easily ascertainable and highly constant for most species. After a primary classification of all the fruiting specimens, an attempt was made to correlate them with the flowering ones. This is rendered imperative, as it is but rarely that one finds both the fruiting and flowering materials on the same specimen. It soon became apparent that certain species are exceedingly distinct in both fruit and flower, while others show considerable variation in the floral characteristics. The species that show the greatest diversity in floral characters are also found to possess extremely polymorphic leaves. To this category belongs the *semitriloba* complex, wherein the greatest number of species have been named.

Mass collections, kindly placed at my disposal by Dr. Edgar Anderson, were studied for two species: *T. semitriloba* and *T. Calderoni*. Though no conclusive proof was arrived at, the study gave sufficient indication that introgression between the species is rampant. The species *T. semitriloba* tends to approach *T. Lappula*, on the one hand, in its characteristic, more or less pandurate leaves and very condensed nodose cymes by the foreshortening of the peduncles and pedicels; and, on the other, *T. bogotensis* by its larger flowers, more showy petals, more densely pubescent fruits, and also by the presence of short simple hairs on the leaves. The variation in the types of inflorescences, and especially the abortion of spines on the surfaces of the fruits (with their presence only on the lateral margins), tend to merge *T. Calderoni* with the genus *Heliocarpus*. Were it not for the presence of the urceolus, certain specimens of *T. Calderoni* would definitely break the generic separation between *Heliocarpus* and *Triumfetta*.

Despite the great quantity of material available for study, at least a third of the species are very imperfectly known; six species being represented only by the types. The genus further presents a problem in distribution, a great many species being strict endemics while a few are pantropic weeds.

A number of species of widespread distribution, as *T. semitriloba*, *T. bogotensis*, *T. Bartramia* and others, apparently have an infinite capacity for variation in minor characters of leaf size, shape, and indument. The extremes often seem quite distinct in themselves but in a study of large numbers of collections they appear to lose their seeming significance. Wherever such intergradations have been found, I have reduced a number of previously described species to synonymy. At the same time I have described a number of novelties which in my opinion are new to

<sup>5</sup>Masters in Oliver, Fl. Trop. Africa 1:254. 1868.

<sup>6</sup>Sprague & Hutchinson, in Jour. Linn. Soc. Bot. 39:231. 1909.



science. With greater abundance of material in the future and intensive study of the genus further reduction may be in order.

#### HISTORY

The genus *Triumfetta* was proposed by Plumier<sup>7</sup> in 1703, in honor of John Baptiste Triumfetti of Bologne, doctor in medicine, lecturer in botany, and director of the botanical garden at Rome. Linneaus<sup>8</sup> in 1737 adopted the genus and described both calyx and corolla, which were depicted in Plumier's rough illustration. In the same year Linneaus<sup>9</sup> gave a detailed description under the same generic name of a plant growing in Clifford's garden, received from either Jamaica or Bermuda, and described it as apetalous. In 1742<sup>10</sup> he altered the description of the genus and stated that it lacked the calyx (corolla). In the first edition of 'Species Plantarum',<sup>11</sup> the description in 'Hortus Cliffortianus' was cited for *T. Lappula*, the only species named under the genus.

Linneaus had already established the genus *Bartramia*<sup>12</sup> which, according to Fawcett and Rendle, was based on a plant in Hermann's Herbarium (now in Herb. Mus. Brit.) with both calyx and corolla. The species *Bartramia indica* was published in 'Species Plantarum' on an earlier page (p. 389) than *Triumfetta Lappula*. As synonyms under *B. indica* Linneaus cited, among others, one of Plukenet's<sup>13</sup> drawings which is rather aptly done and quite diagnostic. Six years later, Linneaus<sup>14</sup> included *Bartramia* in *Triumfetta* and altered the trivial by naming the species *T. Bartramia*.

De Candolle<sup>15</sup>, being unable to determine the identity of *T. Bartramia* on the ground that the synonyms cited include many diverse species, adopted Jacquin's name *T. rhomboidea*.<sup>16</sup> Later botanists followed De Candolle till recently when Fawcett and Rendle<sup>17</sup> established that *T. Bartramia* and *T. rhomboidea* are conspecific. It is, however, to be noted that the earliest trivial is *indica*, but as Lamarck<sup>18</sup> subsequently described *T. indica*, the identity of which is doubtful, it is desirable to adopt the Linnean name *T. Bartramia*. Gaertner<sup>19</sup> maintained the two genera as distinct and further distinguished them by the presence of indivisible fruit with 1-seeded loculi in *Triumfetta*, and divisible fruit and 2-seeded loculi in *Bartramia*. The fruit of *T. Bartramia* is not really dehiscent, but it could be made to separate into component valves by prolonged boiling.

<sup>7</sup>Nov. Pl. Amer. Gen. 40, t. 8. 1703.

<sup>8</sup>Gen. Pl. ed. 1. 344. 1737.

<sup>9</sup>Hort. Cliff. 210. 1737.

<sup>10</sup>Gen. Pl. ed. 2. 243. 1742.

<sup>11</sup>Sp. Pl. ed. 1. 444. 1753.

<sup>12</sup>Fl. Zeylanica, 77. 1748.

<sup>13</sup>Almagest. Bot. 206, t. 41, f. 5. 1691.

<sup>14</sup>Syst. Pl. ed. 10. 1044. 1759.

<sup>15</sup>Prod. 1:508. 1824.

<sup>16</sup>Enum. Pl. Carib. 22. 1760.

<sup>17</sup>Jour. Bot. 59:224. 1921.

<sup>18</sup>Encyc. Meth. 3:420. 1789.

<sup>19</sup>Fruct. & Sem. 2:137. 1791.



De Candolle<sup>20</sup> finally united the two genera and established two sections BARTRAMIA and LAPPULA based on Gaertner's diagnosis, where LAPPULA is separated from BARTRAMIA by the lack of petals and by its indivisible fruits. Endlicher<sup>21</sup> adopted the sections of De Candolle but defined them entirely on the fruit characters. Baillon<sup>22</sup> substituted the name EUTRIUMFETTA for LAPPULA and still distinguished it from BARTRAMIA by the indehiscent fruit. K. Schumann<sup>23</sup> was dissatisfied with the classification based entirely on the characters of the fruit. To him the fruits (and also the leaves) were extremely polymorphic and did not offer any constant characters. He redefined the sections, basing his classification entirely on floral characters: EUTRIUMFETTA being apetalous and without a glandular gonophore, and BARTRAMIA with manifest petals and glandular gonophore.

Sprague and Hutchinson<sup>24</sup> disagreed with K. Schumann's classification as it separated the two very closely related species *T. semitriloba* and *T. Lappula*. They in turn proposed a new classification based on a study of fruits, inflorescences and certain characters derived from the indument of the sepals. According to them, the genus is divided into the following four sections:

1. LEPIDOCALYX: Calyx scaly without; stamens numerous (25-60); ovary 10-loculate, each cell with 1 ovule; fruit spheroid, woody, 8- to 10-loculate, each 1-seeded, the spines fusiform.
2. PROPA: Calyx not scaly; stamens numerous (25-40); ovary 6- to 10-loculate, each with 1 ovule; fruit spheroid, woody, 6- to 10-loculate, each 1-seeded, the spines constricted at the base and the tip.
3. LASIOTHRIX: Calyx not scaly; stamens usually numerous (20-50), rarely few; fruit spheroid, not woody, very light, indehiscent, often 1-seeded, the spines weak, with plumose tip.
4. LAPPULA: Calyx not scaly; stamens numerous or few; fruit spheroid or ovoid, dehiscent or indehiscent, many- or 1-seeded, the spines rigid, the tips rarely plumose.

Since the above classification, there has been no appreciable study of the genus as a whole. Hochreutiner's<sup>25</sup> work is more in the nature of reorganization of the tribe Grewieae than of the genus itself.

#### GEOGRAPHY

*Triumfetta* is pantropic in its distribution. There are 43 species in the western hemisphere, about 50 in Africa and 10 in Australia. The number of valid species in Asia is not known, but may approximate 40 or more. *T. Bartramia* and *T. Lappula* are equally at home in both the eastern and western hemispheres. *T. semitriloba* is abundantly represented in the western hemisphere and to a lesser

<sup>20</sup>Loc. cit. 506. 1824.

<sup>21</sup>Gen. Pl. 1008. 1840.

<sup>22</sup>Hist. Pl. 4:195. 1873.

<sup>23</sup>Mart. Fl. Bras. 12<sup>3</sup>:131. 1886.

<sup>24</sup>Jour. Linn. Soc. Bot. 39:233. 1909.

<sup>25</sup>Ann. Conserv. Jard. Bot. Genève 18:92. 1914.



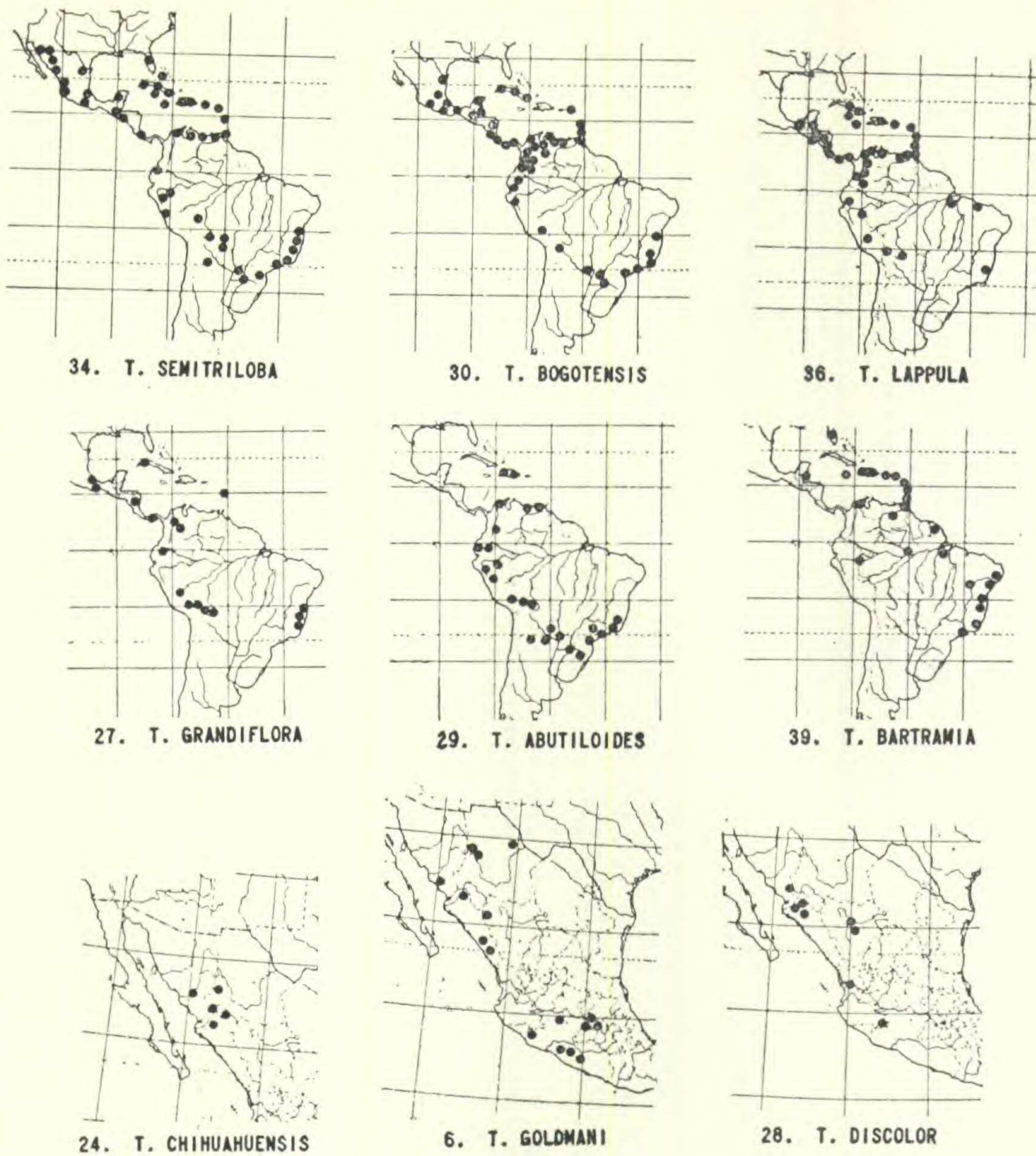


Fig. 1. Geographical distribution of species of *Triumfetta*.

extent in Africa and eastern and southeastern Asia. In the western hemisphere the species extend from tropical Florida to the West Indies, Mexico, and Central America southward to northern Argentina. Species are especially abundant in Mexico and Central America.

There are six species with very extended ranges found in both North and South Americas. The three very closely related species, *T. bogotensis*, *T. semitriloba*, and *T. lappula*, have very similar ranges, each extending from Mexico and the West Indies through Central America southward to northwestern South America, finally to central and eastern South America. *T. grandiflora*, one of the more primitive species, has similar north-south distribution, but is rather sparsely represented throughout its range. *T. bartramia*, whose affinities with the western-hemisphere species is rather doubtful, has an altogether distinct distribution. It



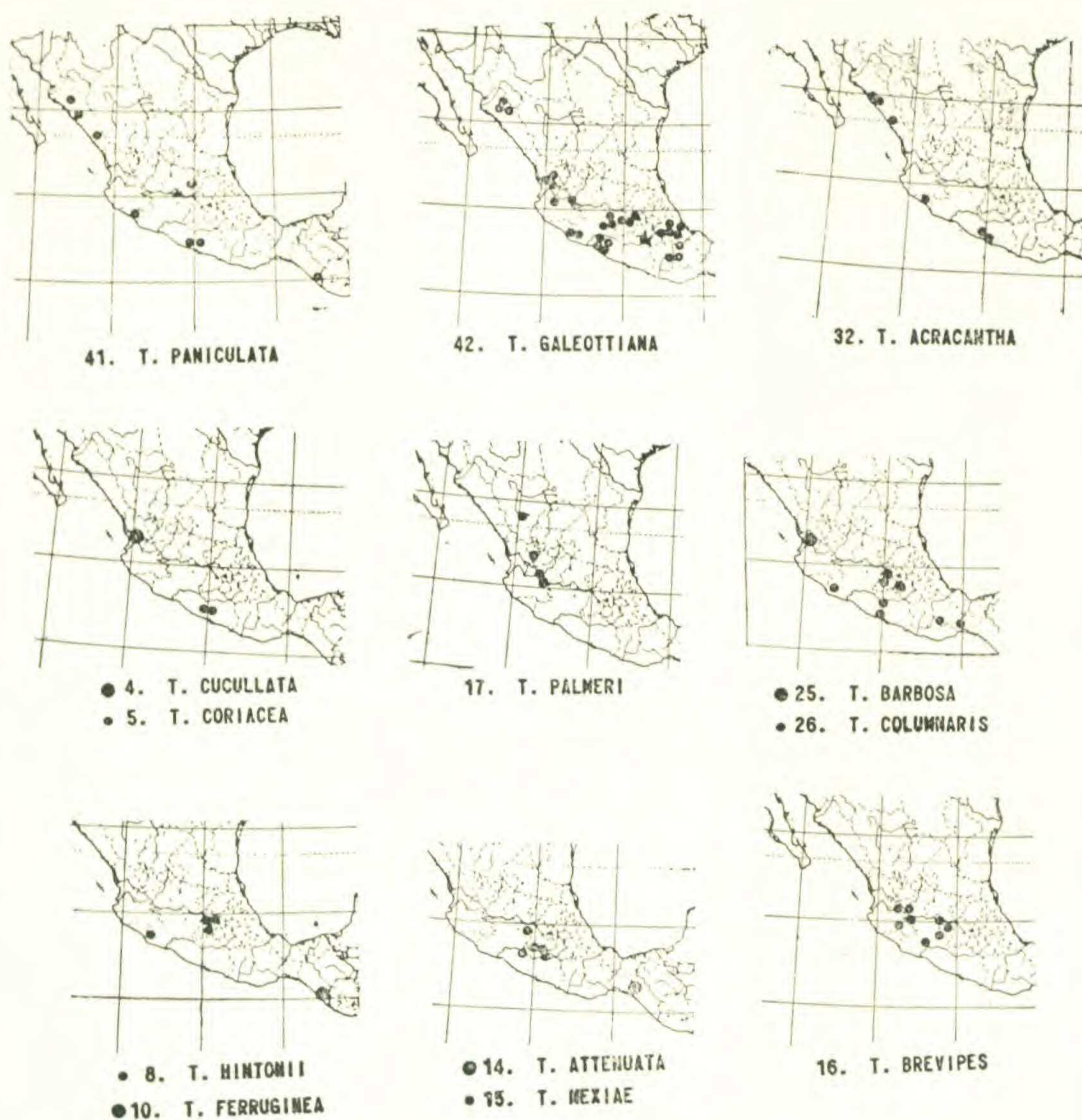


Fig. 2. Geographical distribution of species of *Triumfetta*.

is known in the West Indies and eastern South America, and except for one locality in British Honduras and in Florida, where introduced, it is not represented on continental North America. *T. abutiloides* approximates the distribution of its closely allied species *T. bogotensis*, except that it is not known in continental North America.

There are nine species known only from South America. *T. althaeoides*, which frequents lowland sandy areas, is austral in its distribution, and is found extensively in northern South America wherever suitable habitat is available. *T. obscura*, which is the counterpart of *T. acracantha* from Mexico, is confined to southeastern Brazil. *T. Sampaioi*, a species closely related to *T. Bartramia*, is known only in the lowlands of northeastern Brazil. The three closely related species, *T. longicoma*, *T. multilocularis*, and *T. mollissima*, are found exclusively in southeastern Brazil, Peru, and Colombia respectively. *T. caudata*, *T. sericata*, and *T. persimilis* occupy narrow ranges in Colombia.



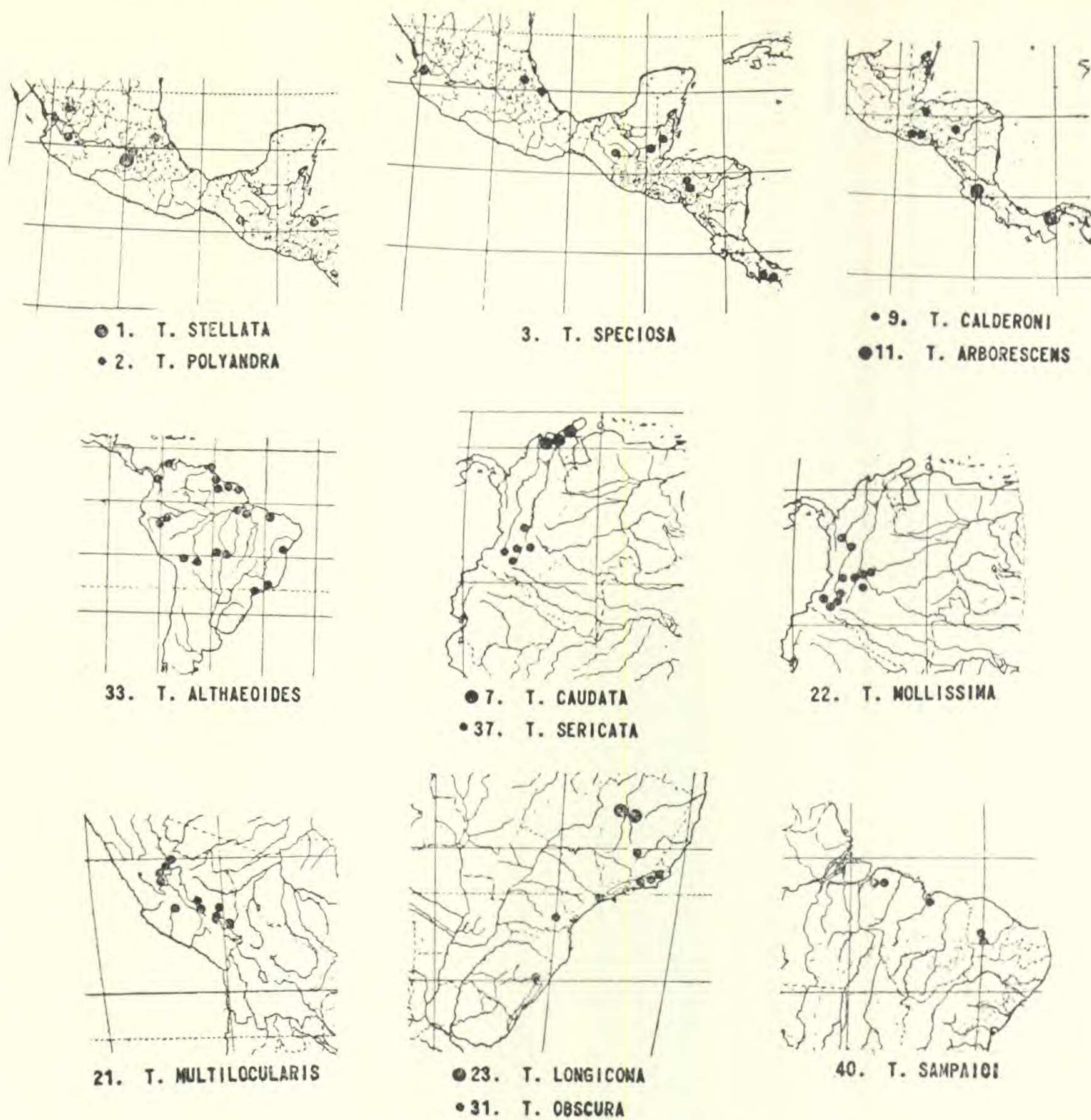


Fig. 3. Geographical distribution of species of *Triumfetta*.

The majority of the species are found in Mexico, and among them are a few that extend into Central America. The two more primitive species, *T. polyandra* and *T. speciosa*, though found sparsely in any particular locality, extend southward into Central America. Most of the species are known only from central and western Mexico. *T. discolor*, *T. Goldmani*, *T. acracantha*, *T. paniculata*, and *T. Galeottiana* are the most prominent species of western Mexico, while *T. brevipes*, *T. Palmeri*, and *T. columnaris* are found rather abundantly in central and southwestern Mexico. The rest of the species are endemics, being known from very restricted areas.

The series GENICULATAE is best represented in Mexico and Central America. Of its fifteen species only two (*T. caudata* and *T. persimilis*) are from Colombia. Because of the presence of the majority of species in central Mexico and northern Central America, including most of the primitive ones and also many very restricted endemics, it is assumed that the primary centre of dispersal of the species is probably from that area.



## MORPHOLOGY

The species of *Triumfetta* are a diverse group of woody plants, usually small trees or shrubs. The series GENICULATAE constitutes species wherein the tree habit is most predominant, although no tree in the genus is known to exceed 5 m.

The stems are terete in all the species except *T. paniculata* where they are ridged or irregularly angled, the ridging occurring as a result of decurrent petiole bases. Certain plants, especially those in the *semitriloba* complex, have a short branch at almost every node of the main axes, while others (as represented by *T. Calderoni*) are sparsely, if ever, branched. The bark is prominently lenticellate, with either small white or large brown lenticels.

The leaves are petiolate. The length of the petiole is usually correlated with the shape of the lamina, the broadly ovate leaves being long-petiolate while the large elliptic ones are shortly so. *T. obscura* is an exception as it has elliptical leaves which are long-petiolate.

The lobing of the leaf generally is a good primary character in certain species, but in others, such as *T. semitriloba*, *T. bogotensis*, and *T. Bartramia*, the general leaf-shape is so variable that it is relatively useless as a definitive character. In general, weedy species of the genus have variously indented or lobed leaves and show much greater variation than the non-weedy ones. The margin is serrated, the serrations usually being very irregular. Most species have small glands on the basal serrations from which the mucilaginous sap exudes. In three species, *T. althaeoides*, *T. cucullata*, and *T. coriacea*, these glands are found on the petioles at the basal sinus. Because of their extreme constancy they offer an easy means of identifying these species.

The term "bract" has been used in this paper to mean the terminal leaves of a branch which subtend the cymes. The bracts are usually very prominent in plants with axillary inflorescences. They are invariably smaller and more shortly petioled than the vegetative leaves and are generally elliptical in outline. No measurements of the bracts are given, as it is difficult to determine from dried material whether they have attained their maximum growth or not.

All species have more or less coarsely pubescent leaves, except *T. acracantha* and *T. obscura* which have glabrescent ones. The leaves usually possess three tiers of induments, two of which consist of stellate hairs, one closely appressed to the surface and the other usually much larger and spreading irregularly, the third tier of simple hairs which are usually much longer and generally more prominent. The nature of the indument offers good primary characters in certain species. However, the use of this character requires great judgment as the pubescence changes considerably during the course of development. Young leaves may be covered rather densely with both stellate and simple hairs, while the mature ones on the same plant may have hairs of one kind only.

The leaves are stipulate. The stipules are usually large and linear and tend to dry from the tip to the base. They are rarely caducous; in most species they



persist even after the shedding of the leaves. No diagnostic importance has been attached to the stipules.

The inflorescence consists of compound aggregate dichasia. In the more primitive species, the cymes, each consisting of 1–3 cymules, are borne in the axils of the bracts. In the more advanced species the cymes are terminal and consist of a shortened sympodial branch system, each bearing 4–6 cymules. There is usually more than one cyme per bract, the cymes being clustered rather densely at the nodes, and the whole inflorescence is usually large and spreading. In both types of inflorescences the cymule is either 2- or 3-flowered. Each cymule is subtended by a pair of fugacious bracteoles. The number of flowers per cymule is not constant even on the same inflorescence, probably due to the abortion of one of the lateral flowers in early ontogeny. The inflorescences are hermaphrodite or, in a few species, gynodioecious.

The species of the genus have considerable range in the size of flowers. Slightly before anthesis the floral buds of *T. polyandra* and *T. speciosa* are as large as 3–4 cm. in length, while those of *T. Lappula* and *T. heliocarpoides* rarely, if ever, exceed 6 mm. The size of the flower is generally a good constant character for most species. However, in *T. bogotensis* the length varies from 7 to 13 mm. and is not correlated with the variations in either the fruit or vegetative characters.

The floral buds in the majority of the species are oblongoid, but in the *Galeottiana* and *Calderoni* complexes they are obovoid in the hermaphrodite flowers.

The sepals afford good specific characters. All plants of the genus bear a sub-apical appendage on the sepals, the lengths of which are generally constant for a given species. *T. Purpusii* and *T. falcifera* possess the longest appendages, usually about 5 to 7 mm. long, and *T. Calderoni* the shortest, being nearly obsolete. Unless otherwise mentioned, the lengths of the sepals given in this paper include the apical appendages. The indument of the sepals may also be used as a primary character in certain species. However, as with the pubescence of the leaves, its use in the identification of a species needs caution.

There is a tendency in the genus towards a completely apetalous condition. The more primitive species, such as *T. polyandra*, *T. multilocularis*, *T. brevipes* and others, have large showy petals, while the more advanced species (*T. Lappula*, *T. Galeottiana*, and *T. heliocarpoides*) are either apetalous or possess very small ones. The petals have a short ciliate claw, which is hairy on the outside and sometimes has a transverse band of stellate hairs on the inner surface at the base of the blade.

The androgynophore or gonophore, with its five spherical or elliptical glands, contributes some important diagnostic characters. The shape of the glands, their size, and whether they are contiguous or otherwise, are usually constant for a species. Because of their extreme smallness, these characters, though mentioned in the specific descriptions, have not been used in the key. The gonophore is slightly accrescent in fruit. *T. Lappula* is the only species known which does not possess a glandular gonophore.



The urceolus is a small, rather membranaceous ring with a ciliate margin, which is borne on the gynophore and completely surrounds the base of the stamens. It is usually 5-lobed, sometimes 10-lobed, and very rarely unlobed. *T. Lappula* and *T. Sampaioi* do not possess an urceolus.

The stamens are borne cyclically on the gonophore, and the number is of great importance in specific criteria. Certain species have as high as 60 (*T. attenuata*, *T. arborescens*), others have about 40 (*T. polyandra*, *T. Purpusii*, *T. paniculata*), while the majority of the species possess between 15 and 25. *T. Sampaioi* is the only species in the western hemisphere which has only 5 stamens. The smaller numbers are rather rare in *Triumfetta*. At least three species are known to be gynodioecious. In these the pistillate flower either has staminodes or lacks them completely. No staminate flower is known for the whole genus.

The filaments have retrorse serrations in both the *semitriloba* and *Bartramia* complexes. Other species have smooth filaments. In *T. chibuabuensis* the bases of the filaments are lightly stellate-pubescent. The anthers do not yield any character of diagnostic value. They are always dorsi-fixed, consisting of two thecae, each with two introrse, longitudinally dehiscent cells. The pollen grains are ellipsoidal, and about 50  $\mu$  long and 35  $\mu$  wide. The surface is minutely rugulose to very nearly smooth.

The number of cells of the ovary is a good specific character. In the series GENICULATAE, the ovary is invariably 2-merous, and in most species of UNCINATAE it is 3-, and rarely 2-loculate. Where the ovary is too small for convenient dissection, the number of locules may be ascertained by dissecting a very small floral bud, and counting the number of stigma lobes. In more mature buds the stigmas, in most species, fuse and do not separate easily. In certain species, however, the stigmas remain separate throughout. The descriptions of the stigma under each species in this paper is that of the later stage.

The style is usually much longer than the stamens, and the stigma is generally exerted above the anthers. However in *T. dioica* and the species of the *Galeottiana* complex the style is shorter than the stamens and the stigma is included by the anthers. It may be of interest to note that these species are the only ones known in the genus which exhibit gynodioecism.

The spinules are small transparent epidermal outgrowths of the ovaries. They are the first to differentiate on the ovaries and retain their shape and size on the mature fruits. They are probably secretory in function, as there are large quantities of mucilage in the early stages of ovary differentiation. In the series STELLATAE and GENICULATAE these spinules are always straight-pointed, while in UNCINATAE they are arcuately recurved. After fertilization, the spines develop from the pericarp, each at the base of a spinule. Sometimes, as in *T. caudata* and especially in *T. Hintonii*, spines fail to develop from every spinule. The spinules are thus carried at the tips of the spines, and usually harden slightly after anthesis. Whatever their degree of rigidity, the spinules are always transparent and hyaline. The nature of the spinules on young fruits, slightly after fertilization, is the best



criterion for determining to which series the plant belongs.

The fruit is the best single character for determining the species. The shape is generally constant for a species. *T. caudata*, *T. Hintonii*, and *T. socorrensis* possess oblongoid fruits, while the rest of the species have either spheroid or sub-orbicular ones. It may be noted that these three species possess much fewer spines than the others.

It is often difficult to speak with certainty regarding the dehiscence of the fruits. In at least three species (*T. polyandra*, *T. grandiflora*, and *T. discolor*) the fruits are easily dehiscent. In certain others, such as *T. semitriloba*, *T. multilocularis*, and *T. althaeoides*, they are quite indehiscent. In a few the fruit can be made to separate into valves by prolonged boiling, but there is no evidence that it actually dehisces in nature.

The number of cells is constant for a given species. Each cell is potentially 2-seeded, but there is a general tendency in most species to the formation of false septae and production of double the number of cells in mature fruit, each with one seed. The reverse is true in three species, *T. Hintonii*, *T. Bartramia*, and *T. Lappula*, where one or more cells abort early in the process of fruit development.

The size of the mature fruit body shows little variation. However, care is needed in the use of this character, as it often is difficult to know from dried material whether a fruit is mature. In general, species with large showy flowers tend to have relatively large fruits. *T. althaeoides* and *T. paniculata* are obvious exceptions as they possess rather large fruits but have very small flowers.

The nature of the pubescence on the fruit is less variable than that of the leaves and stems. Certain species, such as *T. Mexiae* and those in the *Galeottiana* complex, possess glabrous fruits. Sometimes two rather closely allied species may be essentially different only in the pubescence of the fruit body (*T. Purpusii* and *T. falcifera*). In *T. Lappula* a few fruits have been noticed to have densely pubescent bodies and long plumose hairs on the spines when either diseased or attacked by insects. This may be interpreted as traumatic reversion to an ancestral character.

While the general nature of the spinules affords characters for series, those of the spines themselves are characteristic of individual species. The spines may be glabrous or pubescent. When pubescent, they may bear many long hairs (plumose) or short rather irregularly arranged hairs (irregularly pubescent) or short hairs which are all retrorsely pointed (retrorsely pilosulose). Further, the length of the spines and the number per fruit being reasonably constant for a given species, they have been found satisfactory in primary separation of the species. Section LAPPULA is characterized by rigid spines; the only known American species with more or less flexible spines is *T. longicoma*.

The seeds are either ovoid or lenticular, and have a prominent funicular groove. There is a considerable variation in the size of the seeds among the species. Measurements of the mature seeds are given under every specific description.



## GENERIC AND SUBGENERIC RELATIONSHIPS

*Triumfetta* is commonly referred<sup>26</sup> to the tribe Grewieae of the family Tiliaceae and usually is recognized by its characteristic bur-like fruits. The genus is distinct from the other genera of Grewieae except *Heliocarpus*. Some of the more important distinguishing characters between the two genera have been enumerated in my revision of the genus *Heliocarpus*.<sup>27</sup>

In their treatment of the African species of *Triumfetta* Sprague and Hutchinson<sup>28</sup> divide the genus into four sections based on the texture of the fruits, the nature of the spines and the inflorescences, and some characters derived from the indument of the sepals. According to their classification all the American species belong to section LAPPULA, under which they tentatively proposed the three series STELLATAE, GENICULATAE and UNCINATAE.

Before considering the series in detail it is desirable to summarize here the characters of the genus which have been considered primitive:

1. Arborescent habit as opposed to shrubs or annuals.
2. Dense tomentum of both stellate and simple hairs on leaves and branches, usually associated with plumose hairs on spines *versus* glabrescent condition of leaves and branches together with glabrate or retrorsely pilulose spines.
3. Simple inflorescences consisting of 1 or 2 cymules in the axils of the bracts as compared with compound aggregate dichasia where the cymes are borne in dense nodose clusters of 12–20 flowers each.
4. Large showy flowers with many stamens, and multiloculate large fruits *versus* small flowers having few stamens with a tendency towards dioecism; also marked tendency towards reduction of floral parts such as gonophore, gland, urceolus, and petals, and the general progress towards 1-loculate, small, glabrous fruits.

The series STELLATAE is known to me from only one specimen, and I am in no position to comment on its phylogeny or relative antiquity, except to say that it is very closely related to GENICULATAE. The spinules on the ovary are straight and undivided and resemble those in GENICULATAE; but in fruit they consist of 4 to 5 per spine and are stellately arranged.

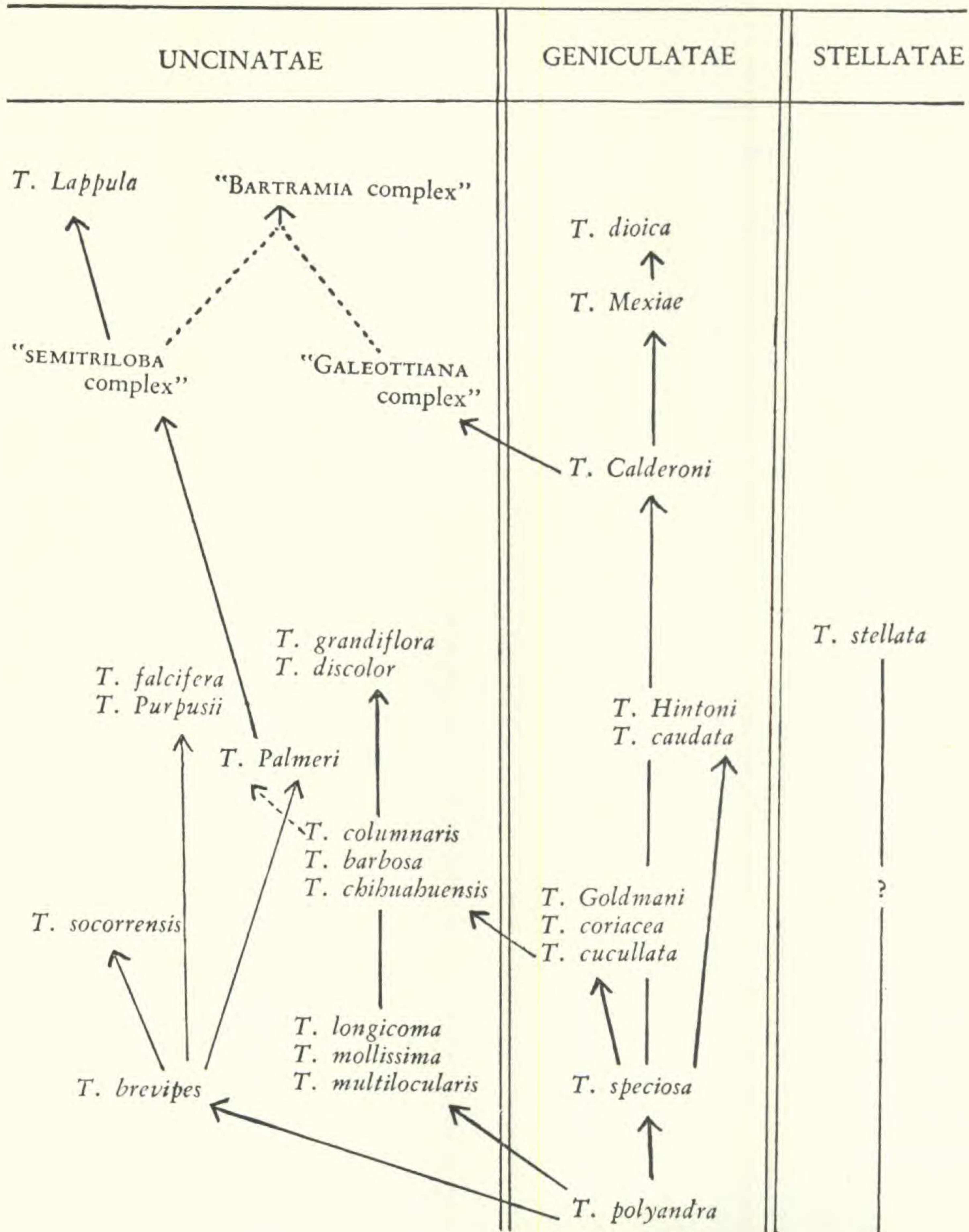
The series GENICULATAE is a relatively small group consisting of 14 species, most of which are rather poorly represented in the herbarium. The species of this series generally possess a tree habit, 2-merous ovary, usually numerous stamens, and ovaries bearing spinules which are either straight or slightly deflexed in fruit, but never recurved. Each spine is terminated by one spinule only. These characters, together with the obvious consideration that a hooked spinule of UNCINATAE is definitely more efficient in the dispersal of fruits than the straight one of GENICULATAE, lead one to the conclusion that GENICULATAE is more primitive.

<sup>26</sup>K. Schumann in Engl. & Prantl, Nat. Pflanzenfam. 3<sup>6</sup>:28. 1895.

<sup>27</sup>Ann. Mo. Bot. Gard. 36:508. 1949.

<sup>28</sup>Jour. Linn. Soc. Bot. 39:233. 1909.





*Triumfetta polyandra* is apparently the most primitive species of the series since it possesses very large showy flowers (the largest known for the genus), numerous stamens, and also very large fruits with very densely plumose spines. The character of the spines in turn relates it to LASIOTHRIX, a section considered to be more primitive than LAPPULA by Sprague and Hutchinson.



The derivation of the species of GENICULATAE from *T. polyandra* is apparently quite simple. *T. speciosa*, with its very large flowers and fruits and its long plumose spines, could be derived from *T. polyandra*, from which it differs in having fewer stamens and much smaller petals. By the reduction in the sizes of flowers and fruits and also in the number of spines, *T. caudata* could be conveniently arrived at from *T. speciosa*. *T. caudata* possesses very plumose spines and densely tomentose fruits, leaves, and branches. *T. Hintonii* culminates this line of reduction, as it has glabrescent leaves and branches, much smaller flowers, very few short spines, and a 1-loculate ovary due to the abortion of one locule. In *T. caudata*, and especially in *T. Hintonii*, the number of spines per fruit is usually much less than the number of spinules on the ovary.

Another line of evolution which stems from *T. speciosa* leads to the *Calderoni* complex, consisting of seven species. The more primitive species of this complex are characterized by the possession of plumose spines and small but densely tomentose fruit bodies. They all have very small flowers usually borne on compound aggregate dichasia, in which each cyme is composed of 12–20 flowers. The derivation of the flowers of this complex from *T. speciosa* is not too clear. The three species, *T. Calderoni*, *T. ferruginea*, and *T. arborescens*, are considered more primitive than the rest of the species in the complex, since they possess numerous stamens, plumose spines, and densely tomentose fruits. *T. Mexiae* is the only species of the genus which has a small gynophore borne upon the gonophore. This character, in conjunction with the glabrate fruits and spines and fewer stamens as compared with the three species mentioned above, makes *T. Mexiae* appear definitely more advanced. *T. attenuata* is very closely related to *T. Mexiae*. Dioecism is attained in *T. dioica*, a species which shows close affinity with *T. Calderoni*.

A second line of evolution from *T. polyandra* leads to *T. coriacea* and *T. cucullata*. It is unfortunate that no fruiting specimen of *T. cucullata* is available. However, in its vegetative and floral characters it is strikingly similar to *T. coriacea*, a species which has numerous stamens and large flowers with showy petals. It differs from *T. polyandra* in its smaller fruits and fewer and less pubescent spines. Except that *T. Goldmani* has fewer stamens, it has much the same characters as *T. coriacea*.

The series UNCINATAE is rather well represented in the herbarium and consists of 27 species in the western hemisphere and about 25 in the eastern. Unlike GENICULATAE, this series is not a compact group, and is apparently polyphyletic in origin, as some of the species with uncinata spinules could be derived more easily from species in GENICULATAE than from those in UNCINATAE. This series is characterized by the members having spinules which are continuously recurved both on the ovary and the spine, by their shrubby habit, by the predominance of 3-merous ovaries, and, except in the more primitive species, by the presence of only 5–25 stamens.



The most obvious direct line of evolution is from *T. brevipes* which, though advanced in many respects, could be easily referred to *T. polyandra* on such primitive characters as the size of the flowers, the presence of numerous stamens, and the large, more or less tomentose fruits with numerous though short spines. This species apparently gives rise to three lines of evolution, of which two end in strict endemism and the third attains a high degree of success and complexity.

In possessing relatively large, showy flowers, and large, more or less tomentose fruits and spines, the endemic species *T. socorrensis* is obviously related to *T. brevipes*; however, it is more advanced than the latter as the number of spines and stamens is considerably less. *T. Purpusii*, another endemic species, has the same type of fruits as *T. brevipes*, though they are slightly smaller and armed with fewer spines. Its flowers still possess numerous stamens, but are rather oddly specialized in having excessively long apical appendages of the sepals. The relationship between *T. Purpusii* and *T. falcifera* is so close that it is sometimes slightly difficult to distinguish the two species when in flower. The fruits of *T. falcifera* and *T. Purpusii* are alike in general shape and size but those of the former are nearly glabrous.

The more successful line of evolution from *T. brevipes* leads to *T. Palmeri*. An interesting specialization appears here for the first time. The spines are clothed lightly with short hairs which are all retrorsely pointed. This feature, together with hooked spinules, is of definite advantage in the dispersal of the fruits by animals. Though *T. Palmeri* has retrorsely pilosulose spines, it still possesses large flowers and fruits. The highly successful and widely distributed *semitriloba* complex may be derived from this type by the reduction in the sizes of flowers and fruits, and also by the inflorescences becoming slightly more compound. Further reductions in the floral parts leads to *T. Lappula*, a very widely distributed species of the genus.

There is a considerable confusion with regard to the delimitation of *T. semitriloba*. Some authors<sup>29, 30</sup> treat it in a very inclusive sense, to include all plants which have retrorse hairs on their spines but are not *T. Lappula*. This inclusive interpretation is not satisfactory, because some of the segregate species are distinct even to a casual observer.

It is more usual to split the complex into many species, chiefly distinguishing them on the size of the flowers, shape and size of the leaves, and on pubescence. This treatment does not solve the problem either, as most of the so-called species appear to be connected by numerous intermediate forms which defy classification in the herbarium. The difficulty is further enhanced by the incomplete nature of the specimens, classification being frequently uncertain in the absence of mature fruit.

The variation in the size and shape of the leaves is of such great magnitude that it is usually impossible to match two specimens with any degree of certainty by

<sup>29</sup>K. Schumann in Mart. Fl. Bras. 12<sup>3</sup>:135. 1886.

<sup>30</sup>Uittien in Pulle, Fl. Surinam 3:56. 1932.



the use of leaf characters only. Other characters being very similar, the leaves usually may vary from undivided to deeply and profoundly 3-lobed, the lobing being either above or below the middle of the lamina. The size of the flowers is relatively less variable, but there are instances, especially in *T. bogotensis*, where it does not correlate with the other trends. The nature of the pubescence is slightly more constant, though there is a very considerable variation in the degree. Apparently the kind of hairs, whether stellate, simple, or both, is generally constant for a species, as it tends to vary with the general shape and size of the petals and fruits together with the number of locules and the nature of the spines.

On some of these more constant characters, I have recognized six species in the *semitriloba* complex, with the hope that it would be more satisfactory from both the practical and taxonomic standpoints. Some of the more important characters which help in the identification of the species are discussed briefly under each, besides those mentioned in the key.

The three South American species, *T. multilocularis*, *T. mollissima*, and *T. longicoma*, are related in but a superficial way to *T. brevipes*. The very definitely 2-merous ovaries, the general tendency towards a tree habit, and the large fruits with very plumose spines relate them more closely with *T. polyandra*. Among themselves, the relationships to one another are extremely strong. *T. multilocularis*, though a very distinct species, has hitherto been mistaken for *T. mollissima* in the herbarium. *T. longicoma* is the most advanced member of the three.

*Triumfetta chihuabuensis*, *T. barbosa*, and *T. columnaris* are three distinct but very closely related species. Although they have a few characters in common with *T. Palmeri*, they do not exhibit any close affinity to that species and are much more closely related to *T. coriacea* and *T. Goldmani*. Without the uncinata spinule, one would certainly experience difficulty in identifying *T. columnaris* and *T. Goldmani*. It is most probable that these three species of UNCINATAE are derived directly from the three geniculate species, *T. cucullata*, *T. coriacea*, and *T. Goldmani*. *T. grandiflora* and *T. discolor* are definitely related in having dehiscent fruits and rather large showy flowers with about 20 stamens. They are in turn related to *T. mollissima*.

The *Galeottiana* complex (consisting of the three species, *T. paniculata*, *T. Galeottiana*, and *T. heliocarpoides*) is of great interest in that though the three are definitely uncinata, they do not show any close affinity with any other species of the series. However, there is a very remarkable similarity between this complex and the *Calderoni* complex in GENICULATAE. The two complexes have the same type of inflorescence, flowers of the same shape and structure, and fruits whose superficial resemblance is rather striking despite the fact that all species of the *Galeottiana* complex have essentially glabrous fruits. All species in the *Calderoni* complex have 2-merous ovaries, and *T. paniculata* bridges this difference in possessing a 4-loculate fruit. The affinity is further strengthened by the



tendency of *T. paniculata* to a tree habit, its numerous stamens, and its relatively large fruit. *T. Galeottiana* and *T. heliocarpoides* are not only closely related species but are also very closely allied with *T. paniculata*. Though the three are distinct, sometimes the delimitation of the species becomes very difficult especially when immature fruiting specimens are being considered. Both *T. Galeottiana* and *T. heliocarpoides* attain gynodioecism.

The *Bartramia* complex, consisting of four species, *T. sericata*, *T. brachistacantha*, *T. Bartramia*, and *T. Sampaii*, is really problematic in its relationships. In the possession of cymes in dense nodose clusters the species resemble those of the *Galeottiana* complex, but, on the other hand, the oblongoid floral buds and pubescent fruits make them resemble the *semitriloba* complex. The picture is further complicated by the fact that *T. Bartramia* is a pantropic weed which is equally at home in both the eastern and western hemispheres. Though the complex does not attain gynodioecism, there is considerable reduction in the floral parts and in the size of the fruits, which are the smallest known for the American species. The fact that *T. Sampaii* lacks an urceolus and has only five stamens places it in approximately the same degree of advancement and specialization as *T. Lappula*. *T. sericata* resembles *T. bogotensis* in having the same general type of flowers and indument, but has much smaller fruits with glabrous spines. *T. brachistacantha* has characters which are about intermediate between those of *T. sericata* and *T. Bartramia*. The relationships of the species of the *Bartramia* complex with those of the western hemisphere are not too apparent. Its affinity may be with either the *semitriloba* or *Galeottiana* complexes, or possibly with both.

From the above discussion of some of the salient characters and relationships of the species, it is quite obvious that no definition of the series could be given which would suit all the species. The characters are superposed in such a manner that hardly any two are correlated. I am unable to give any precise definition of the series as there are nearly as many exceptional forms as there are typical ones. Further, an attempt at classifying the genus based on characters derived from the size of the flowers, types of inflorescences or the nature of the stigmas (as suggested by Hochreutiner<sup>31</sup>) leads one into similar dilemmas.

Because of these apparent reticulate combinations of the characters, I am led to the conclusion with the original authors that the "series, though very useful for the purposes of a *clavis*, do not coincide with natural groups, but appear to represent three of the phylogenetic stages through which many species of section LAPPULA have passed, the stellate arrangement being the most primitive and the uncinata the most highly modified."<sup>32</sup> The three series are here maintained not only for the sake of convenience, but because they are the nearest approach to the real relationship of the species.

<sup>31</sup> Ann. Conserv. Jard. Bot. Genève 18:92. 1914.

<sup>32</sup> Sprague & Hutch. Jour. Linn. Soc. Bot. 39:240. 1909.



## CHROMOSOME COUNTS

Chromosome counts were made for the following three species:

<i>Triumfetta Bartramia</i> .....	2n .....	32
<i>Triumfetta Calderoni</i> .....	2n .....	32
<i>Triumfetta semitriloba</i> .....	2n .....	32

The counts were made from root-tips of plants raised in a greenhouse at Missouri Botanical Garden. The seeds for *T. Calderoni* were collected by Dr. Edgar Anderson from Honduras, and those for *T. Bartramia* and *T. semitriloba* were sent to me by Dr. Brandao-Joly from São Paulo, Brazil. As none of the plants flowered meiotic counts could not be made.

## ACKNOWLEDGMENTS

I have been able to examine specimens, including many valuable types, from several major herbaria in Europe and North America and South America. The herbaria where specimens have been obtained for study, together with the symbols<sup>33</sup> employed in their citations are as follows:

- BR Jardin Botanique de l'État Bruxelles.
- C Universitetes Botaniske Museum, Copenhagen.
- FM Chicago Natural History Museum, Chicago.
- G Institut de Botanique Systematique de l'Université, Genève.
- GH Gray Herbarium of Harvard University, Cambridge, Mass.
- K Herbarium Royal Botanical Gardens, Kew.
- MICH University of Michigan Herbarium, Ann Arbor.
- Mo Herbarium Missouri Botanical Garden, St. Louis.
- NY Herbarium New York Botanical Garden, New York.
- P Muséum National d'Histoire Naturelle, Paris.
- R Museu Nacional, Rio de Janeiro.
- S Naturhistoriska Riksmuseet, Stockholm.
- TRIN Herbarium Department of Agriculture, Port of Spain, Trinidad.
- U Botanisch Museum en Herbarium, Utrecht.
- UC University of California Herbarium, Berkeley.
- US U. S. National Herbarium of Smithsonian Institution, Washington, D. C.

Dot maps have been prepared from most of the specimens from which the exact locality could be determined. In the Index to Exsiccatae all the numbered and most of the unnumbered collections have been cited.

I wish to acknowledge my indebtedness to the curators of the institutions mentioned above, and to the Director of Missouri Botanical Garden, where this study was made. For illustrations and aid in chromosome counts I am indebted to Marilyn Amy Gage. Particular thanks are due to Dr. R. E. Woodson, Jr., for his advice, guidance, and constructive criticism.

## TAXONOMY

TRIUMFETTA L. Sp. Pl. ed. 1. 444. 1753; DC. Prod. 1:506. 1824; K. Schum. in Mart. Fl. Bras. 12<sup>3</sup>:131. 1886, in Engl. & Prantl, Nat. Pflanzenfam. 3<sup>6</sup>:28. 1895; Sprague & Hutch. in Jour. Linn. Soc. Bot. 39:231. 1909; Hochr. in Ann. Conserv. Jard. Bot. Genève 18:92. 1914.

*Bartramia* L. Sp. Pl. ed. 1. 389. 1753.

<sup>33</sup>The symbols used are as suggested by Lanjouw in Chron. Bot. 5:143. 1939.



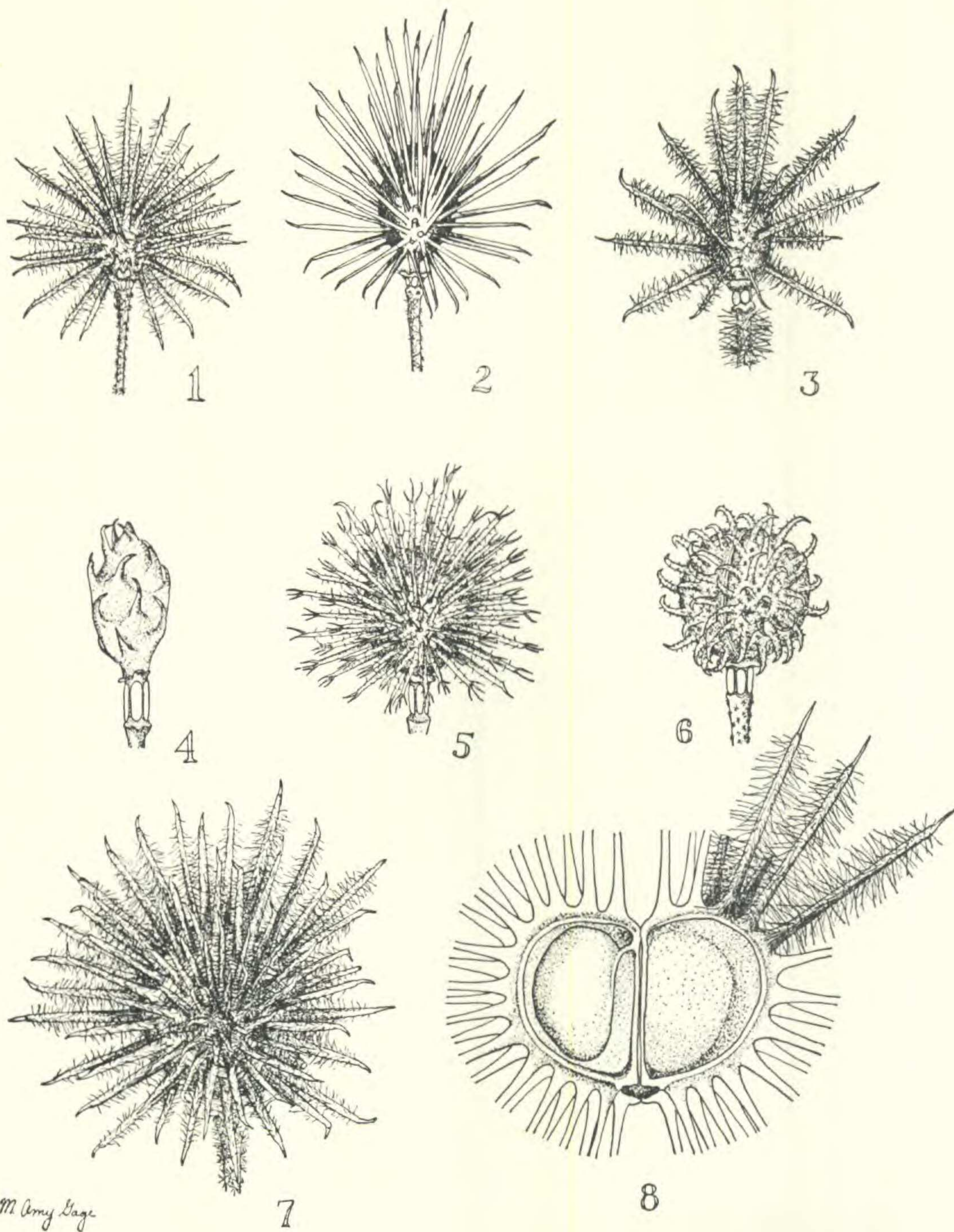


Fig. 4. Illustrations of taxonomic criteria for Series STELLATAE and GENICULATAE:

1. Small orbicular fruit of *T. Calderoni* with densely plumose spines.
2. Suborbicular fruit of *T. Mexiae* borne on a short gynophore above the gonophore.
3. Suborbicular to oblongoid fruit of *T. caudata* with about 25 plumose spines.
4. Oblongoid fruit of *T. Hintonii* with few short spines.
5. Fruit of *T. stellata* with 3-5 spinules per spine.
6. Orbicular fruit of *T. Goldmani* with falcate spines.
7. Large fruit of *T. speciosa* with densely plumose spines.
8. Large, easily dehiscent fruit of *T. polyandra* with large, very densely plumose spines.



Shrubs or trees. Leaves alternate, petiolate, stipulate, the stipules usually large, persistent, rarely fugacious, the blade 3- to 5-lobed or undivided, the venation palmate, 5- to 7-costate at the base. Inflorescences hermaphrodite or gynodioecious, usually axillary (terminal in few species), consisting of numerous aggregate dichasia. Flowers either hermaphrodite or pistillate, staminate ones not known, hypogynous, 5-merous; sepals 5, valvate, free, with apical appendages; petals 5, sometimes absent, free, imbricate, 3- to 5-nerved, shorter than the sepals, usually ciliate at the base (claw); gonophore bearing 5 spherical or elongate glands manifest, absent in some species, usually crowned by a ciliate, rather membranaceous ring (urceolus) surrounding the stamens; stamens 5-60 in hermaphrodite flowers, staminodial or absent in the pistillate, borne cyclically on the enlarged gonophore, with 2 thecous, 4-celled, introrse, longitudinally dehiscent anthers, the filaments free, usually glabrous, sometimes pubescent at the base, often with retrorse serrations; ovary wholly superior, sessile on the gonophore (except in *T. Mexiae*, with very short gynophore on the gonophore), ellipsoid to orbicular, covered with many short, either erect or recurved, hyaline spinules, 2- or 3-loculate, each with 2 anatropous collateral pendulous ovules, the style filiform, the stigma briefly 2- or 3-parted, sometimes capitate. Fruits dry, indehiscent or loculicidally dehiscent, 2- or 3-loculate, each cell 2-seeded, or falsely 6- to 9-loculate, or each cell 1-seeded, or 1-loculate with 1 seed due to abortion, usually sessile on the slightly accrescent gonophore, lappaceous, the spines elongating from the pericarp at the bases of the spinules; seeds compressed-ovoid or pyriform, with a more or less prominent funicular groove, the cotyledons folded, the endosperm oily.

Standard species: *Triumfetta Lappula* L.

#### KEY TO THE SERIES

- A. Hyaline spinules of ovary straight, in fruit either straight or slightly deflexed, or consisting of 3-5 stellately arranged; ovaries 2-merous; stamens 20-60, most of the species with 40 or more; usually small trees 3-5 m. tall.
- B. Each spine with 3-5 stellately arranged spinules; mature floral buds pandurate..... STELLATAE (p. 334).
- BB. Each spine with 1 straight or slightly deflexed spinule; mature floral buds oblongoid or obovoid..... GENICULATAE (p. 336)
- AA. Hyaline spinules of ovaries and fruits arcuately recurved; ovaries 3- or rarely 2-merous; stamens 5-40, most of the species with less than 30; usually shrubs 1-3 m. high..... UNCINATAE (p. 349)

SERIES STELLATAE Sprague & Hutch. in Jour. Linn. Soc. Bot. 39:240. 1909.

#### 1. TRIUMFETTA *stellata* Ko Ko Lay, sp. nov.

Arbores parvae 3 m. altae. Ramuli graciles dense stellato-pubescentes. Folia anguste ovata interdum obscure 3-lobata 5-6 cm. longa 2-3 cm. lata ad basim subtruncata vel subcordata longe acuminata subdupliciter serrata utrinque pilis sparsis stellatis; petiolis 1-3 cm. longis pilis fulvis stellatis pubescentibus. Inflorescentiae axillares, cymis cymulis 4-5, pedunculis plerumque 4-6 mm. longis, pedicellis 2-3 mm. longis. Flores hermaphroditi, alabastro maturo pandurato 8-9



Fig. 5. *Triumfetta stellata*

mm. longo; sepalis ellipticis circiter 10 mm. longis extra minute stellato-puberulentis, appendiculis circiter 0.25 mm. longis; petalis obovatis brevissimis 2-3 mm. longis, unguilo 1.0-1.5 mm. longo extra breviter villosa; gonophoro circiter 1.5 mm. longo, glandulis ellipticis circiter 1.0 mm. longis 0.5 mm. latis; urceolo 0.3 mm. alto 5-lobato breviter ciliato; staminibus 25-30, filamentis usque ad 5-7 mm. longis glabris; ovario breviter oblongo-ellipsoideo circiter 1 mm. longo, spinulis 35-40 erectis, stylo glabro 2-3 mm. longo, stigmatibus breviter 2-fido. Fructus globosi non dehiscentes, corpore ipso 3 mm. diametro 2-loculari, loculis 1-spermis cano-tomentosis, aculeis 2-3 mm. longis inaequilater breviter pubescentibus, spinulis 3-5 per aculeo; seminibus maturis haud visis.

MEXICO: MÉXICO: Temascaltepec, Las Mesas, alt. 2000 m., Oct. 25, 1933, *Hinton 4460* (HOLOTYPE in Herb. Kew.).



The affinities of this very distinct species are doubtful. It has a superficial resemblance to *T. Galeottiana*, but can be recognized easily in fruit by the 3 to 5 stellately arranged spinules on the spines, and in flower by its pandurate floral buds with very small obovate petals, which also have small foveae at about the tip of the claw.

SERIES GENICULATAE Sprague & Hutch. in Jour. Linn. Soc. Bot. 39:240. 1909.

## KEY TO THE SPECIES

- A. Sepals at anthesis 2–4 cm. long; mature fruit body 4–10 mm. in diameter.
- B. Sepals at anthesis 3.5–4.0 cm. long, the apical appendages 1–3 mm. long; spines 4 mm. long or more, densely plumose.
- C. Leaves broadly elliptical to obovate, the petioles about 1 cm. long or less; petals broadly obovate, subequalling the sepals; fruit easily dehiscent, 1.2–3.0 cm. wide including the spines, the spines 0.6–1.0 cm. long; southern Mexico and Honduras..... 2. *T. polyandra*
- CC. Leaves ovate to 3-lobed, the petioles 3–5 cm. long; petals elliptical, less than half the length of the sepals; fruit indehiscent, 1.0–1.5 cm. wide including the spines, the spines 3–5 mm. long; southern Mexico to Panama..... 3. *T. speciosa*
- BB. Sepals at anthesis 2.0–2.5 cm. long, the apical appendages about 1 mm. long; spines 2–3 mm. long, lightly pubescent to glabrescent (not known in *T. cucullata*).
- C. Leaves 11–15 cm. long, the petioles with 2–4 prominent spherical glands at the basal sinus; petals broadly obovate, about 22 mm. long.
- D. Leaves elliptical, acute, the petioles about 1.5 cm. long; stamens 20; coastal west-central Mexico..... 4. *T. cucullata*
- DD. Leaves broadly ovate to 3-lobed, acuminate, the petioles 4–6 cm. long; stamens 40; southwestern Mexico..... 5. *T. coriacea*
- CC. Leaves 5–7 cm. long, the petioles without glands at the basal sinus; petals elliptical to narrowly obovate, 1.2–1.6 cm. long; western Mexico..... 6. *T. Goldmani*
- AA. Sepals at anthesis 0.4–1.6 cm. long; mature fruit body 2–3.5 mm. in diameter.
- B. Sepals at anthesis 1.0–1.6 cm. long; fruit body oblongoid, the spines 25 or fewer.
- C. Stem and petioles densely ferruginous-tomentose; leaves pubescent on both surfaces, densely so beneath; sepals densely tomentose without; mature fruit tomentose, 2-loculate, the spines 3–5 mm. long; Colombia..... 7. *T. caudata*
- CC. Stem and petioles glabrescent; leaves essentially glabrous on both surfaces; sepals nearly glabrate without; mature fruit glabrate, 1-loculate, the spines 1–2 mm. long; central Mexico.... 8. *T. Hintonii*
- BB. Sepals at anthesis 0.4–1.0 cm. long; fruit body globose or subglobose, the spines 50 or more.
- C. Petals 1–2 mm. long; leaves densely tomentose; spines plumose, the fruit densely tomentose (not known in *T. ferruginea*).
- D. Apical appendages of the sepals nearly obsolete; leaves cuneate to rounded at the base, rarely subcordate; Honduras and El Salvador..... 9. *T. Calderoni*
- DD. Apical appendages of the sepals manifest; leaves distinctly cordate.
- E. Inflorescences hermaphrodite; sepals 7–10 mm. long; style 4–6 mm. long.
- F. Flowering peduncles 2–4 mm. long; floral buds obovoid; stamens 40–60.
- G. Apical appendages of the sepals 2–3 mm. long, plumose; stamens about 60; stigma undivided; southern Mexico.. 10. *T. ferruginea*



- GG. Apical appendages of the sepals about 1 mm. long, lightly pubescent; stamens 40-50; stigma 2-lobed; Costa Rica and Panama..... 11. *T. arborescens*
- FF. Flowering peduncles about 1 mm. long; floral buds oblongoid; stamens about 20; Colombia..... 12. *T. persimilis*
- EE. Inflorescences gynodioecious; pistillate sepals 4-5 mm. long; style about 2 mm. long; southern Mexico..... 13. *T. dioica*
- CC. Petals 3-7 mm. long; leaves glabrescent; spines and fruits glabrate (not known in *T. attenuata*).
- D. Leaves long-attenuate, the veins on lower surfaces glabrate; sepals essentially glabrous without, the apical appendages about 2 mm. long; stamens 60; style about 6 mm. long; southern Mexico..... 14. *T. attenuata*
- DD. Leaves shortly acute to acuminate, the veins on the lower surfaces pubescent; sepals lightly stellate-pubescent without, the apical appendages less than 1 mm. long to nearly obsolete; stamens 40; style about 2 mm. long; southwestern Mexico.... 15. *T. Mexiae*

2. TRIUMFETTA POLYANDRA DC. Prod. 1:508. 1824. (T.: based on Sessé & Mociño's *tab. 117* in *Herb. Genève*).<sup>34</sup>

*Triumfetta obovata* Schlecht. et Cham. in *Linnaea* 5:288. 1830. (T.: *Schiede & Deppé s. n.*).

*Triumfetta insignis* S. Wats. in *Proc. Am. Acad.* 22:400. 1887. (T.: *E. Palmer 152*).

Small trees or large shrubs about 3-4 m. high; branches and inflorescence axes very densely tomentose with long ferruginous hairs. Leaves broadly elliptical to obovate, 13-15 cm. long and 10-12 cm. wide, the base rounded or subcordate, the tip abruptly acuminate, doubly and regularly serrate, both surfaces scabrous, rather densely tomentose with both simple and stellate hairs; petioles short, stout, about 1 cm. long, covered rather densely with long hairs. Inflorescences on axillary and terminal branches, the cymes of 2-3 cymules, the flowering peduncles 5-9 mm. long, the pedicels 3-5 mm. long. Flowers hermaphrodite, the buds oblongoid, 30-35 mm. long slightly before anthesis, the apical appendages 1-3 mm. long; sepals narrowly obovate, about 36 mm. long, covered rather densely with many long coarse hairs without; petals broadly obovate, showy, 2.7-3.2 cm. long and 5-6 mm. wide, the claw 5-6 mm. long, densely plumose; gonophore short and stout, about 0.75 mm. long and 2.0 mm. thick, the glands oblong, subequalling the gonophore; urceolus about 0.75 mm. high, many-lobed, lightly ciliate; stamens 40-50, the filaments glabrous; ovary spheroid, 3 mm. long, the style 25-28 mm. long, the stigma acute. Fruit spherical, easily dehiscent, the body 6-10 mm. in diameter, densely plumose, 4-loculate, each 2-seeded, the spines numerous, 6-10 mm. long, densely plumose with long hyaline or ferruginous hairs, the spinules erect; seeds ovoid, about 2 mm. long and wide.

Rather rare plants which grow in open forests, usually upon rocky mountain slopes at altitudes of 800-1500 m. in southern Mexico and northern Honduras; flowering from August to September, the fruit maturing from late October and persisting on the plant until early December.

<sup>34</sup>Hochr. in *Ann. Conserv. Jard. Bot. Genève* 18:110. 1914.



MEXICO: CHIAPAS: Chacomuselo, alt. 800 m., *Matuda 4436* (Mo). JALISCO: Río Blanco, *E. Palmer 152* (Mo, US), *252* (US); slopes of barranca near Guadalajara, *Pringle 4469* (BR, Mo); bluffs near Guadalajara, alt. 5000 ft., *Pringle 9694* (Mo, US); on the road between Colotlán and Bolaños, *Rose 2822* (NY). MÉXICO: Temascaltepec, Luvianos, alt. 1300 m., *Hinton 5900* (US). NAYARIT: Tépica, between Pedro Paula and Acuponeta, *Rose 1927* (NY). VERA CRUZ: Mirador and vicinity, *Liebmann 512, 521* (US), alt. 3500 ped., *Linden Suppl. 26* (BR), *47* (BR, G); Cordillera, Zacuapán, alt. 2000–3000 ped., *Galeotti 7062* (BR).

HONDURAS: YORO: Aguan River valley, vicinity of Coyoles, alt. 1000 ft., *Yuncker, Koepfer & Wagner 8167* (Mo).

This species is very distinct and can be easily recognized by its large showy flowers, the largest known for the genus, and also by the extremely characteristic large, easily dehiscent fruits with many long very plumose spines. De Candolle based his description on the sketch of Sessé and Mociño. I have seen a photograph of the original sketch and have no difficulty in recognizing that *T. insignis* of S. Watson is conspecific with it. I have not seen the type of *T. obovata*, but my interpretation of that species is based on the original description, which was later amplified by Turczaninow on Linden's Supplementary Collection No. 47, which I have seen.

3. TRIUMFETTA SPECIOSA Seem. Bot. Voy. Herald, 86. 1853. (T.: *Seemann 1240*).

*Triumfetta macrocalyx* Turcz. in Bull. Soc. Nat. Moscou 31<sup>1</sup>:230. 1858. (T.: *Linden Suppl. 25*).

*Triumfetta micropetala* Hochr. in Ann. Conserv. Jard. Bot. Genève 18:98. 1914. (T.: *Linden Suppl. 25*).

Small trees or large shrubs 3–4 m. high; branches and inflorescence axes scurfy, densely covered with ferruginous tomentum. Leaves broadly ovate, generally 3-lobed, 6–9 cm. long and 5–7 cm. wide, the base rounded or subcordate, the middle lobe long-attenuate, the laterals short and blunt, the serrations very irregular, usually blunt and often glandular, the upper surface dark green, coarse with many short stellate hairs, the lower pallid, densely tomentose; petioles 3–5 cm. long, lightly pubescent. Inflorescences axillary, the cymes of 1–2 cymules, usually opposite the bracts, the flowering peduncles 4–5 mm. long, the pedicels 6–8 mm. long. Flowers hermaphrodite, large, the buds oblongoid, 30–35 mm. long slightly before anthesis, the apical appendages about 2 mm. long; sepals narrowly elliptical, about 35 mm. long with many separate tufts of long stellate hairs without; petals ovate, short, about 6 mm. long, the claw about 3–4 mm. long, very densely plumose; gonophore about 1 mm. long and 2 mm. wide, the glands spherical, sub-equalling the gonophore; urceolus short, about 0.5 mm. high, many-lobed, lightly ciliate; stamens 20, the filaments glabrous; ovary ovoid, about 1.5 mm. long, the style 30–34 mm. long, with many short separate tufts of stellate hairs, the stigma acute. Fruit orbicular, the body 6–8 mm. in diameter, rather densely pubescent, 4-loculate, each cell 2-seeded, on maturity with 8 distinct 1-seeded locules, the spines numerous, 100 or more, each 3–4 mm. long, densely plumose with short hairs, the spinules erect; seeds ovoid, about 2.0 mm. long and wide.



A species of relatively scattered distribution, which extends from southern Mexico to Panama; usually growing in open areas on slopes of mountains, or along the rocky banks of streams at altitudes of 1300–1700 m.; flowering from late July to September, the fruit persisting on the plants until late February or March.

MEXICO: CHIAPAS: Siltepec, *Matuda 1581* (Mo). JALISCO: San Sebastián, trail to El Ranchito, alt. 1500 m., *Mexia 1444* (Mo, US). VERA CRUZ: Mirador, *Linden Suppl. 25* (BR, FM photo); Zacuapán and vicinity, *Purpus 1918* (Mo, NY, US), *3749* (Mo, UC); Cordillera, locality not mentioned, *Galeotti 1973* (BR), *4162* (BR).

BRITISH HONDURAS: Vaca Falls District, *Record s. n.* (US).

GUATEMALA: ALTA VERAPAZ: Patal, alt. 1600 m., *Tuerckheim II 1546* (Mo); San Cristóbal, *Tejada 265* (US).

HONDURAS: MORAZAN: La Montañita, alt. 1400 m., *Williams & Molina R. 10636* (Mo); Mt. Uyuca, alt. 1600 m., *Williams & Molina R. 10252* (Mo).

PANAMA: CHIRIQUÍ: Boquete, *Seemann 1240* (K); Volcán de Chiriquí, Boquete Distr., alt. 7000 ft., *Davidson 515, 895* (Mo); Finca Lérida to Boquete, alt. 1300–1700 m., *Woodson, Allen & Seibert III 5* (Mo).

This species is characterized by its very large flowers and disproportionally short petals, and also by its large fruits with briefly plumose spines. It is rather interesting to note that both the species of Turczaninow and Hochreutiner are primarily based on *Linden Suppl. 25*, a sheet which was apparently examined also by Seemann, as he cites a Linden collection from Vera Cruz, Mexico.

4. TRIUMFETTA CUCULLATA Fernald, in Bot. Gaz. 20:532. 1895. (T.: *Lamb 579*).

Shrubs about 2–3 m. high; lower branches sparingly pubescent, the upper and the inflorescence axes densely cinereous-tomentose. Leaves elliptical, about 13–15 cm. long and 4–5 cm. wide, the base obtuse, with 4 spherical glands at the basal sinus, the serrations generally glandular, the upper surface lightly stellate-pubescent, the lower more densely so; petioles 1.0–1.5 cm. long, densely tomentose. Inflorescences axillary, the cymes of 3 cymules, generally condensed, the flowering peduncles about 3 mm. long, the pedicels 3–5 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 22–24 mm. long slightly before anthesis, constricted slightly above the base, the apical appendages slender, 0.5–1.0 mm. long, very lightly pubescent; sepals oblong, 22–25 mm. long including the apical appendages, stellate-tomentose without, glabrescent within; petals broadly obovate, about 23 mm. long and 6–7 mm. wide, the claw about 4–5 mm. long, densely plumose; gonophore short and stout, about 1.5 mm. long and 2–3 mm. wide, the glands quadrangular, broad, about 1.0 mm. long and 1.5 mm. wide; urceolus short, about 0.5 mm. high, distinctly many-lobed, briefly ciliate; stamens 20, the filaments smooth, densely pubescent at the base; ovary orbicular, about 1.5 mm. long, the spinules about 50, erect, the style about 22 mm. long, the stigma acute. Fruit not seen.

Known only from the type. Flowers in February.

MEXICO: NAYARIT: Tépica, Zopelote, alt. 2000–3000 ft., *Lamb 579* (Mo, US).

Though very imperfectly known, this species may be easily identified by its short-petiolate elliptic leaves, by its large showy flowers, and also by its possession of only 20 stamens with the filaments densely pubescent at the base.



5. *TRIUMFETTA CORIACEA* Hochr. in Ann. Conserv. Jard. Bot. Genève 18:108. 1914. (T.: *Langlassé 815*).

Small trees or large shrubs 3–4 m. high; branches and inflorescence axes glabrescent, brownish. Leaves broadly ovate to 3-lobed, 11–14 cm. long and 8–12 cm. wide, the base cuneate to rounded, the tip long-acuminate; the serrations regular and usually double, the upper surface glabrate, the lower very lightly pubescent to glabrescent; petioles stout, 4–6 cm. long, with 2 or 4 prominent glands at the basal sinus. Inflorescences axillary, rarely terminal, the cymes of 2–3 cymules, borne very loosely in nodose clusters, the flowering peduncles 6–8 mm. long, the pedicels 2–4 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, about 22 mm. long slightly before anthesis, constricted in the middle, the apical appendages very short, about 0.5 mm. long; sepals elliptical, 22–24 mm. long, rather lightly stellate-pubescent without; petals broadly obovate, 20–22 mm. long and 6–8 mm. wide, the claw about 3 mm. long, densely plumose; gonophore slender, 1–2 mm. long, the glands elliptical, subequalling the gonophore; urceolus about 0.5 mm. high, many-lobed, lightly ciliate; stamens about 40, the filaments glabrous; ovary ovoid, about 1.5 mm. long, the spinules numerous, erect, the style about 22 mm. long, the stigma acute. Immature fruit orbicular, the body essentially glabrous, 2-loculate, each cell 1-seeded, the spines numerous, rather short; mature fruit not seen.

Southwestern Mexico, usually growing on hillsides in pine and oak forests at altitudes of 800–1000 m.; flowering from middle of December to late January.

MEXICO: GUERRERO: San Vicente de San Juan, alt. 920 m., *Hinton 11193* (GH); Plan de Carrizo, Galeana, alt. 850 m., *Hinton 11056* (GH); Sierra Madre, alt. 800 m., *Langlassé 815* (G, GH, US).

This species can be recognized by its glabrescent, broadly ovate to 3-lobed leaves with 2–4 spherical glands on the petioles at the basal sinus; and also by its large, showy flowers with deep yellow broadly obovate petals. It is unfortunate that mature fruiting specimens are unavailable.

6. *TRIUMFETTA GOLDMANI* Rose, in Contr. U. S. Nat. Herb. 12:285. 1909. (T.: *Goldman 264*).

*Triumfetta sanctae-luciae* Sprague, in Kew Bull. 114. 1923. (T.: *Seemann 2147*).  
*Triumfetta quercetorum* Bullock, loc. cit. 295. 1937. (T.: *Hinton 6746*).

Small trees or large shrubs 3.0–3.5 m. high; branches and inflorescence axes with many short stellate hairs, later becoming glabrate. Leaves elliptical to narrowly ovate, 5–7 cm. long and 2–3 cm. wide, the base cuneate or rounded, the tip narrowly and gradually long-attenuate, the serrations rather regular, both surfaces scabrous with many short stellate and simple hairs; petioles slender, 1.0–1.5 cm. long, rather lightly but coarsely pubescent; bracts of the same general shape as the vegetative leaves. Inflorescences axillary, rarely terminal, the cymes of 1–2 cymules, always in the axils of the bracts, the flowering peduncles 4–6 mm. long, the pedicels about 4 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, 18–20 mm. long and 2–3 mm. wide slightly before anthesis, the apical



appendages slender, 1–2 mm. long; sepals narrowly ovate, about 20 mm. long, with few separate tufts of short stellate hairs without; petals elliptical to narrowly obovate, 12–16 mm. long and about 3 mm. wide, the claw 4–5 mm. long, densely plumose; gonophore large, about 2.5 mm. long and 1.5 mm. wide, the glands elliptical, subequalling the gonophore; urceolus short, about 0.25 mm. high, many-lobed, lightly ciliate; stamens 20, the filaments glabrous, ovary orbicular, about 1.5 mm. long, the spinules about 75, erect, the style about 16 mm. long, the stigma either acute or briefly bifid. Fruit spheroid, the body 4–5 mm. in diameter at maturity, lightly pubescent, 4-loculate, each cell 1-seeded, the spines falcate, about 75, 2–3 mm. long, lightly pubescent with few short hairs; seeds pyriform, about 1.5 mm. long and wide.

Rather common plant of western and central Mexico, usually growing in oak and pine forests in shady slopes under trees in moist places or on edges of meadows along streams at altitudes of 600 to 2000 m.; flowering in September and October, the fruit persisting until late January.

MEXICO: CHIHUAHUA: Arroyo Hondo, Sierra Charuco, *Gentry 1768* (Mo, US); San José de Pinál, Río Mayo, *Gentry 2841* (Mo); Guicorichi, Río Mayo, alt. 5000 ft., *Gentry 1967* (Mo); El Carrizo, alt. 800 m., *Ortega 6011* (US); Balboa, *Ortega 5043* (US). DURANGO: Sierra Tres Picos, alt. 3500 ft., *Gentry 5296* (Mo); La Bajada, Tamazula, alt. 300 m., *Ortega 4252* (US). GUERRERO: Mina, Zihuagio-Ojo de Agua, alt. 1640 m., *Hinton 9710* (US); Mina, Chiriagua, alt. 1600 m., *Hinton 9847* (GH), *10663* (GH, Mo, US); Pilas Filo Mayor, alt. 1800 m., *Hinton 10750* (GH, US); Chilacayote-Espadinas, alt. 1500 m., *Hinton 14927* (GH, US). MÉXICO: Temascaltepec: Rincón del Carmen, alt. 1340 m., *Hinton 1953* (Mo); Nanchititla, *Hinton 3082* (GH, K), *4962* (K); Pungarancha, alt. 950 m., *Hinton 5253* (Mo, US), *6746* (GH, K, Mo, US); Ypericones, *Hinton 6996* (Mo, US). MICHOACAN: Coalcomán: Salitre-mesa, alt. 1780 m., *Hinton 12492* (GH, US); Pto. Zarzamora, alt. 1660 m., *Hinton 12262* (GH, US). SINALOA: Santa Lucia, alt. 1200 m., *Seemann 2147* (GH, K); Sierra de Choix, 50 miles n. e. of Choix, *Goldman 264* (US); Cerro de la Sandia, northeast of Panuco, alt. 1800–2000 m., *Pennell 20121* (US); Quebrada de Mansana, Sierra Suratato, alt. 4000–4500 ft., *Gentry 6582* (Mo); Sierra Madre Mts., "El Batél", alt. 4000 ft., *Mexia 431* (Mo); Quebrada Chica, San Ignacio, alt. 1380 m., *Narvaez & Salazar 100* (US). SONORA: Arroyo del Agua Blanco, Dist. Álamos, *Gentry 506M* (US).

The fruits of this species are very characteristic, being spheroid with about 75 falcate, lightly pubescent spines. Though the spines are slightly recurved the spinules are erect. The small elliptical to narrowly ovate leaves and the relatively large flowers with yellow, narrowly obovate petals make this species convenient to identify. The leaves of the type of *T. quercetorum* are very slightly more pubescent than those of *T. Goldmani*, but in both they are nearly glabrate and the variation is only slight.

7. TRIUMFETTA CAUDATA Tr. & Planch. in Ann. Sci. Nat. Bot. IV, 17:353. 1862. (T.: "Río Hacha", *Purdie s. n.* in Herb. Kew.).

Small trees or shrubs 2–3 m. high; branches and inflorescence axes covered very densely with rich orange-brown simple and stellate hairs. Leaves broadly ovate, 11–15 cm. long and 8–10 cm. wide, the base rounded to subcordate, the tip gradually and narrowly long-attenuate, the serrations blunt, small, usually double and regular, the upper surface scabrous, lightly pubescent, the veins more



densely so, the lower rather densely tomentose with both stellate and simple hairs; petioles 3–5 cm. long, densely covered with orange-brown hairs. Inflorescences axillary, the cymes of 2–3 cymules, usually in the axils of the bracts, the flowering peduncles 4–5 mm. long, the pedicels 3–4 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, 10–15 mm. long slightly before anthesis, the apical appendages 1–2 mm. long, densely pubescent; sepals oblong, 12–16 mm. long with dense orange-brown pubescence without; petals narrowly obovate, subequalling the sepals, the claw 2–3 mm. long, rather densely plumose; gonophore short, about 0.5 mm. long, the glands small, spherical; urceolus about 0.5 mm. high, many-lobed, densely ciliate; stamens 20–25, the filaments glabrous; ovary ovoid, about 0.75 mm. high, the spines 40–50, erect, the style 7–8 mm. long, the stigma acute. Fruits oblongoid, the body 2–3 mm. in diameter and 3–5 mm. long at maturity, densely pubescent with many short stellate and simple hairs, 2-loculate, each cell 1-seeded, the spines 20–25, each 3–5 mm. long, densely plumose with short grayish hairs; seeds ovoid, about 1.5 mm. long and wide.

Apparently rare plants known only from Colombia, where they grow on the borders of forests and open grasslands at altitudes of about 750 m.; flowering from October to December, and the fruits maturing in January and February.

COLOMBIA: MAGDALENA: près de Molina, Río Hacha, *Purdie s. n.* (K); Minca, *Apolinar 627* (US). SANTA MARTA: Onaca, alt. 2500 ft., *H. H. Smith 1688* (G, Mo, NY, UC, US), *1907* (Mo, NY).

This is an extremely distinct species, and is characterized by its branches and petioles being densely covered with lustrous ferruginous tomentum, by the leaves which are profoundly cordate with long attenuate tips, by the large and spreading inflorescences, and also by its small ellipsoid fruits with about 25, rather densely tomentose spines.

8. *TRIUMFETTA HINTONII* Sprague, in *Kew Bull.* 294. 1937. (T.: *Hinton 7018*).

Small trees 2.5–6.0 m. high; branches and inflorescence axes very lightly pubescent, glabrescent. Leaves broadly ovate to elliptical, 8–11 cm. long and 3–5 cm. wide, the base cuneate to rounded on younger ones, subcordate on more mature ones, the tip gradually and narrowly acuminate, the serrations small, blunt, usually double and regular, the upper surface dark green, very lightly pubescent to nearly glabrate, the lower pallid, slightly more pubescent than the upper; petioles 2–3 cm. long, lightly pubescent. Inflorescences axillary, the cymes of 2 cymules, usually opposite the bracts, the flowering peduncles 3–5 mm. long, the pedicels 2–3 mm. long. Flowers hermaphrodite, the buds oblongoid, 9–11 mm. long at anthesis, the apical appendages very small, nearly obsolete; sepals oblong, 10–12 mm. long, lightly stellate-pubescent without; petals narrowly obovate, 6–7 mm. long, the claw very distinct with a constriction at the tip, about 3 mm. long, densely plumose; gonophore slender, about 2 mm. long, the glands oblong, about half the length of the gonophore; urceolus short, about 0.5 mm. high, 5-lobed, lightly ciliate; stamens 15–20, the filaments smooth, glabrous; ovary ellipsoid, about 1.5 mm. long, the spinules 40–50, erect, the style about 6 mm. long, the



stigma acute, sometimes briefly 2-lobed. Fruit ellipsoid, the body about 6 mm. long and 3.0–3.5 mm. wide at maturity, glabrous, 2-loculate, each cell 1-seeded, but only one maturing, the other aborting completely, the spines slightly falcate, short, 1–2 mm. long, only 10–16 remaining at maturity; seeds pyriform, about 2.5 mm. long and 1.5 mm. wide.

Known only from central Mexico, growing in pine and oak forests, along streams at altitudes of 2000–2400 m.; flowering from June to September, the fruit maturing from October to November.

MEXICO: MÉXICO: Temascaltepec: La Labór, alt. 2000 m., *Hinton* 3837 (K, US); Cajones, alt. 2480 m., *Hinton* 4224 (K); Nanchititla, *Hinton* 5324 (K, US); La Labór, *Hinton* 6594 (GH, Mo, US); Cumbre de Tejupilco, *Hinton* 7018 (K, Mo, US); Pantoja, *Hinton* 7027 (Mo, US). MICHOACAN: Coalcomán, Sierra Torricillas, alt. 2140 m., *Hinton* 12343 (GH).

This species has very characteristic fruits. The flower is quite normal for the genus, bearing a 2-loculate ovary with 40–50 straight-pointed spinules. After fertilization, most of the spines fail to develop at the bases of the spinules; thus the mature fruit body becomes rugose in places where the spines have not elongated sufficiently; furthermore, one of the locules aborts completely, and only one 1-seeded locule matures. In their oblongoid fruits and also in their marked tendency towards having a smaller number of spines on the fruit than of spinules on the ovaries, *T. Hintonii* and *T. caudata* are closely related.

9. TRIUMFETTA CALDERONI Standl. in Jour. Wash. Acad. 14:98. 1924. (T.: *Calderón* 78).

Small trees or large shrubs 6–8 m. high; branches and inflorescence axes covered densely with both fine stellate and long spreading coarse stiff hairs. Leaves broadly ovate to obscurely 3-lobed, 10–15 cm. long and 7–11 cm. wide, the base rounded or subcordate, the tip gradually and narrowly long-acuminate, the serrations coarse and irregular, blunt and usually glandular, the upper surface dark green, lightly but coarsely pubescent with many short suppressed stellate hairs, the lower pallid, densely pubescent with long spreading stellate and simple hairs; petioles 5–7 cm. long, densely pubescent; bracts elliptical. Inflorescences terminal, large and spreading, with many small, caducous bracts, the cymes of 4–6 cymules, rather lax in flower though generally crowded in fruit, the flowering peduncles about 3–4 mm. long, the pedicels 3–5 mm. long. Flowers hermaphrodite, the buds broadly obovoid, constricted towards the base, about 5 mm. long at anthesis, the apical appendages very small to nearly obsolete; sepals elliptical, 5–7 mm. long, whitish and densely tomentose without, yellow-brown and glabrescent within; petals obovate, small, about 2 mm. long, the claw very short, lightly plumose; gonophore short and stout, about 0.5 mm. long and 1.5 mm. wide, the glands very small, spherical; urceolus about 0.25 mm. high, many-lobed, lightly ciliate; stamens 40, the filaments glabrous; ovary ovoid, about 1 mm. long, the spinules about 50, erect, the style 2–3 mm. long, the stigma acute. Fruit spheroid, the body 2–3 mm. in diameter at maturity, rather densely tomentose, 2-loculate, each cell 1-



seeded, the spines about 50, 4–5 mm. long, densely plumose with relatively long stiff white hairs; seeds pyriform, about 1.0 mm. long and wide.

Common weedy plant of Honduras and El Salvador, chiefly found in dry rocky thickets at altitudes of 450–1000 m.; flowering in October, the fruit maturing in late December to January.

HONDURAS: CHOLUTECA: San Marcos, alt. 1000 m., pine forest area, *Williams & Molina R. 10923* (Mo). EL PARAÍSO: 8 kms. west of Ojo de Agua, *Williams & Molina R. 10676* (Mo). MORAZÁN: San Antonio, road near Zamorano, *Williams & Molina R. 11160* (Mo).

EL SALVADOR: SAN JOSÉ: *Calderón 1929* (GH, US). SAN SALVADOR: vic. Tonacatepeque, *Standley 19475* (GH, US); vicinity of San Salvador, alt. 650–850 m., *Standley 22782* (GH, US); San Salvador, *Calderón 78* (GH, US), *354* (US), *1257* (GH, Mo, US). DATA INCOMPLETE: *Choussy 55* (US).

This species can be recognized in fruit by its long slender, rather densely plumose spines, and in flower by the absence of apical appendages on the sepals, and also by the short petals.

10. *TRIUMFETTA ferruginea* Ko Ko Lay, sp. nov.

Ramuli graciles dense pubescentes pilis ferrugineis et stellatis et simplicibus. Folia late ovata interdum 3-lobata 6–7 cm. longa 5–7 cm. lata base profunde cordata apice longe acuminata supra pilis sparsis stellatis, infra dense canescentia vel ferrugineo-tomentosa; petiolis 3–4 cm. longis dense ferrugineo-tomentosis. Inflorescentiae terminales, cymis circiter 6 cymulis in axillis bractearum dense confertis, bracteis ellipticis vel lanceolatis, pedunculis plerumque 3 mm. longis, pedicellis 1–2 mm. longis. Flores hermaphroditi, alabastro maturo obovoideo 6–7 mm. longo; sepalis ellipticis 7–9 mm. longis extra breviter denseque stellato-pubescentibus, appendiculis circiter 2 mm. longis dense plumosis; petalis obovatis brevissimis 1.5–2.0 mm. longis, unguilo circiter 0.5 mm. longo extra dense plumosa; gonophoro circiter 0.5 mm. longo 1.5 mm. lato, glandulis quadrangularibus circiter 1.0 mm. longis; urceolo 0.5 mm. alto multilobato breviter ciliato; staminibus 60, filamentis usque 3–4 mm. longis glabris; ovario ovoideo circiter 1 mm. longo, spinulis 30–40 erectis, stylo glabro circiter 4 mm. longo, stigmatibus acuto. Fructus maturi desunt.

MEXICO: CHIAPAS: Las Pilas, June 2, 1904, *Goldman 1050* (holotype in U. S. Nat. Herb.).

Related to *T. arborescens* from which it may be easily distinguished by its more numerous stamens and much longer apical appendages of the sepals. I have not seen any fruiting specimen of this species.

11. *TRIUMFETTA ARBORESCENS* (Seem.) Sprague, in *Kew Bull.* 351. 1923.

*Heliocarpus arborescens* Seem. *Bot. Voy. Herald*, 86. 1853. (T.: "Panama," *Seemann s. n.* in *Herb. Kew.*).

Small trees 5–6 m. high; branches and inflorescence axes scurfy, densely tomentose with short ferruginous stellate hairs. Leaves broadly ovate, usually 3-lobed, 10–13 cm. long and 7–10 cm. wide, the base cordate, the middle lobe long-



Fig. 6. *Triumfetta ferruginea*

attenuate, the laterals acute, the serrations very irregular, the basal ones glandular, the upper surface scabrous, covered lightly with many short stellate hairs, the lower densely tomentose with both simple and stellate hairs, becoming less so at maturity; petioles slender, 6–9 cm. long, densely ferruginous-tomentose. Inflorescences terminal, the cymes of 3–5 cymules, condensed in nodose clusters, the flowering peduncles 2–4 mm. long, the pedicels about 2 mm. long. Flowers hermaphrodite, the buds obovoid, 6–7 mm. long slightly before anthesis, constricted towards the base, the apical appendages about 1 mm. long; sepals broadly



elliptical, 7–10 mm. long, pallid and densely tomentose without, yellow-brown and glabrescent within; petals obovate, short, about 2–3 mm. long, the claw very short, briefly plumose; gonophore slender, about 0.75 mm. long, the glands elliptical, subequalling the gonophore; urceolus about 0.5 mm. high, indistinctly lobed, briefly ciliate; stamens about 50, the filaments smooth, glabrous; ovary ovoid, about 0.75 mm. long, the spinules about 75, erect, the style about 5 mm. long, the stigma very briefly 2-fid. Fruit suborbicular, the body 2–3 mm. in diameter and 3–4 mm. long at maturity, cinereous-pubescent, 2-loculate, each cell 1-seeded, the spines about 75, 3–4 mm. long, reddish-brown, shortly plumose; seeds pyriform, about 0.75 mm. long and wide.

COSTA RICA: GUANACASTE: vicinity of Tilarán, alt. 500–650 m., *Standley & Valerio 45709* (US).

PANAMA: COCLÉ: between Paso del Arado and Olá, in savannahs and thickets, alt. 20–280 m., *Pittier 5017* (US). DATA INCOMPLETE: *Seemann 96* (GH), *s. n.* (K); *Cowell 239* (NY).

Rather rare small trees of Costa Rica and Panama; flowering in December and the fruit maturing in January and February.

12. *TRIUMFETTA persimilis* Ko Ko Lay, sp. nov.

Frutex circiter 1 m. altus. Ramuli graciles dense pubescentes, pilis ferrugineis et stellatis et simplicibus. Folia late ovata vel 3-lobata 10–14 cm. longa 8–10 cm. lata base profunde cordata apice longe acuminata margine irregulariter serrata interdum glandulosa supra pilis sparse stellatis scabratis, infra dense canescenti-tomentosa; petiolis 3–4 cm. longis dense tomentosis. Inflorescentiae terminales, cymis 3–4 cymulis, bracteis ovatis vel obscure 3-lobatis, pedunculis circiter 1 mm. longis, pedicellis 6–8 mm. longis. Flores hermaphroditi, alabastro maturo oblongoideo 6–8 mm. longo; sepalis ellipticis 7–9 mm. longis extra longe et dense stellato-tomentosis, appendiculis circiter 2 mm. longis dense plumosis; petalis ellipticis, 6–7 mm. longis, unguilo 0.5–1.0 mm. longo extra breviter plumoso; gonophoro circiter 0.25 mm. longo, glandulis quadrangularibus; urceolo 0.25 mm. alto, 5-lobato breviter ciliato; staminibus 20, filamentis usque ad 5–6 mm. longis glabris; ovario ovoideo circiter 1.5 mm. longo, spinulis 70–80 erectis, stylo glabro 3–4 mm. longo, stigmatate breviter 2-fido. Fructus globosus non dehiscens, corpore ipso 2–3 mm. diametro, dense canescenti-tomentosus 2-locularis, loculis 2-spermis, aculeis circiter 75, 3–4 mm. longis dense plumosis; seminibus ovoideo-acutis, circiter 1.5 mm. longis et latis.

COLOMBIA: SANTANDER: en terrenos secos y arenosos a orillas del Río Chicamocha, en pescadero, alt. 500 m., Dec. 1948, *Araque & Barkley 18S.286* (holotype in Herb. Mo. Bot. Gard., isotype in U. S. Nat. Herb.).

In flower this species has a superficial resemblance to *T. caudata*, but its fruits are much more strikingly similar to those of *T. Calderoni*. It may be easily recognized by its densely tomentose leaves, small oblongoid floral-bud with only 20 stamens, and by its spheroid fruit with many densely plumose spines.



13. *TRIUMFETTA DIOICA* T. S. Brandg. in Univ. Calif. Publ. Bot. 10:412. 1924. (T.: *Purpus* 9256).

Small trees about 3 m. high; branches and inflorescence axes covered densely with many long grayish-brown hairs. Leaves broadly ovate to obscurely 3-lobed, 8–11 cm. long and 5–7 cm. wide, the base deeply cordate, the tip gradually and narrowly long-acuminate, the serrations very irregular, usually blunt, the basal ones glandular, the upper surface dark green, scabrous with many long appressed simple and stellate hairs; petioles 4–6 cm. long, slender, densely clothed with long spreading hairs. Inflorescences gynodioecious, the pistillate terminal, the cymes of 4–6 cymules in dense nodose clusters, the flowering peduncles and pedicels about 2 mm. long. Hermaphrodite flower not seen, the pistillate small, the floral bud 3–4 mm. long slightly before anthesis, the apical appendages short, 1 mm. long or less; sepals narrowly elliptical, 4–5 mm. long, pallid and densely tomentose without, yellow-brown and glabrescent within; petals elliptical to narrowly obovate, small, about 1.5 mm. long, the claw nearly obsolete; gonophore short, about 0.5 mm. long, the glands oblong, subequalling the gonophore; urceolus about 0.5 mm. high, many-lobed, briefly ciliate; ovary ovoid, about 1.5 mm. long, the spinules about 50, erect, the style about 2 mm. long, the stigma briefly 2-fid. Fruit spheroid, covered with about 50 slender, densely plumose spines; mature fruit not seen.

Known only from Chiapas, Mexico. Flowers in September.

MEXICO: CHIAPAS: Hacienda Monserrate, *Purpus* 9256 (Mo, UC, US); Buena Vista, *Purpus* 9285 (UC).

It is unfortunate that this species is so imperfectly known. Due to the lack of mature fruits and hermaphrodite flowers its proper position is rather obscure. It is apparently related to *T. Calderoni* in the possession of small flowers and spheroid fruits with numerous plumose spines.

14. *TRIUMFETTA attenuata* Ko Ko Lay, sp. nov.

Ramuli glabri irregulariter punctati lenticellis multis parvis tecti. Folia late ovata 10–14 cm. longa 6–9 cm. lata base subtruncata vel rotundata apice longe attenuata subdupliciter serrata utrinque glabrata; petiolis gracilibus 6–9 cm. longis glabris. Inflorescentiae terminales, cymis 4–5 cymulis, pedunculis 5–7 mm. longis, pedicellis 4–5 mm. longis. Flores hermaphroditi, alabastro maturo obovato 6–7 mm. longo; sepalis ellipticis vel anguste obovatis 7–9 mm. longis extra glabrescentibus, appendiculis circiter 2 mm. longis glabris; petalis obovatis 6–7 mm. longis, unguilo circiter 1.5 mm. longo dense plumoso; gonophoro circiter 0.75 mm. longo 1.5 mm. lato, glandulis ellipticis 0.5–0.75 mm. longis; urceolo 0.5 mm. alto 5-lobato breviter ciliato; staminibus 60, filamentis usque ad 5–7 mm. longis glabris, spinulis circiter 75 erectis, stylo glabro circiter 6 mm. longo, stigmatate acuto. Fructus maturi desunt.

MEXICO: CHIAPAS: Escuintla, Dec. 1936, *Matuda* 0488 (holotype in Herb. Mo. Bot. Gard.; isotypes in Herb. Univ. Michigan, and U. S. Nat. Herb.).



This species is most closely related to *T. Mexiae*, from which it may be distinguished easily by its glabrate leaves and floral buds, the much longer apical appendages of the sepals, and its style which is about 6 mm. long with the stigma exerted above the stamens. It is unfortunate that no fruiting material of this species is available.

15. *TRIUMFETTA Mexiae* C. V. Morton & Ko Ko Lay, sp. nov.

Arbores parvae 5-6 m. altae. Ramuli inferne glabrati apicem versus tomentosi pilis multis brevibus stellatis. Folia late ovata 8-11 cm. longa 6-9 cm. lata base cuneata vel rotundata apice longe acuminata subdupliciter serrata utrinque pilis sparsis stellatis mox glabrescentia, nervis subtus pallidioribus pilis brevibus stellatis; petiolis 3-5 cm. longis sparse stellato-pubescentibus. Inflorescentiae terminales, cymis cymulis 4-5, pedunculis 2-3 mm. longis, pedicellis 3-4 mm. longis. Flores hermaphroditi, alabastro maturo obovoideo 5-6 mm. longo; sepalis anguste obovatis 5-8 mm. longis extra breviter stellato-pubescentibus; petalis ellipticis vel anguste obovatis 4-6 mm. longis, unguilo circiter 2 mm. longo dense plumoso; gonophoro circiter 0.75 mm. longo 1.0 mm. lato, glandulis ellipticis circiter 0.75 mm. longis; urceolo 0.25 mm. alto multilobato breviter ciliato; staminibus 40, filamentis usque ad 3-4 mm. longis glabris; ovario ovoideo circiter 1.5 mm. longo, stigmatibus breviter 2-fido. Fructus globosi non dehiscentes, gynophoro brevi supra gonophorum, corpore ipso 3-4 mm. diametro glabro 2-loculari, loculis 2-spermis, aculeis 75-100 gracilibus glabris; seminibus ovoideo-acutis circiter 2 mm. longis et latis.

A rather common species of southwestern Mexico, growing at altitudes of 1000 to 1200 m.; flowering in September and early October, the fruits maturing from late October to November.

MEXICO: GUERRERO: Sierra Madre del Sur, north of Río Balsas, Distr. Adama, Temisco, barranca below Ore Mill, alt. 1265 m., *Mexia* 8834 (holotype in U. S. Nat. Herb.; isotypes in Gray Herb., Herb. Mo. Bot. Gard., and Herb. Univ. Calif.); mountains near Iguala, alt. 2500 ft., *Pringle* 9228 (GH, MICH, US); Iguala Cañon, *Pringle* 10069 $\frac{1}{2}$  (GH, MICH, US); between Sochi and Tlalkinsala, alt. 3600-4800 ft., *Nelson* 2036 (NY, US); Coyuca-Chacamerito, *Hinton* 6621 (US). MICHOACÁN: Zitacuaro-La Mora, alt. 1325 m., *Hinton* 13230 (GH).

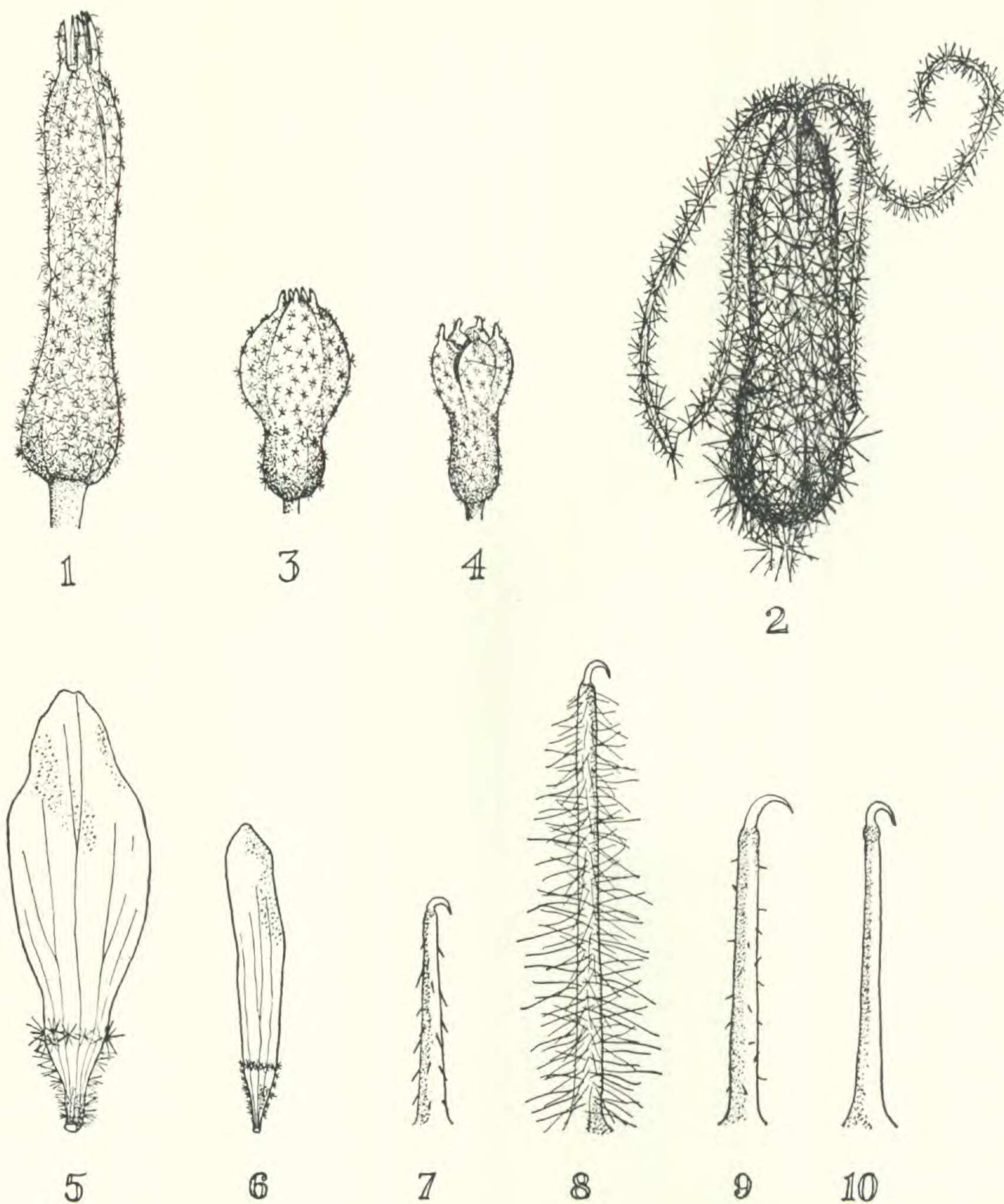
There is a great superficial resemblance in the aspects of the flowering specimens of this species to those of *Heliocarpus occidentalis* Rose. It is, however, quite distinct from other species of *Triumfetta* and can easily be recognized.

SERIES UNCINATAE Sprague & Hutch. in Jour. Linn. Soc. Bot. 39:240. 1909.

KEY TO THE SPECIES

- A. Flowers hermaphrodite, the buds oblongoid, the style at least 3 times the length of the ovary; fruits distinctly pubescent.
- B. Petioles usually less than 1.5 cm. long, the leaves elliptical, at least twice as long as broad; southwestern Mexico.
- C. Fruit with more than 100 short, straight, glabrous spines, each about 1 mm. long; sepals at anthesis 13-16 mm. long; stamens 25-30..... 16. *T. brevipes*





M. Amy Sage

Fig. 7. Illustrations of taxonomic criteria for Series UNCINATAE:

1. Narrowly oblongoid floral bud of *T. Palmeri* with relatively short apical appendages.
2. Narrowly oblongoid floral bud of *T. Purpusii* with very long apical appendages.
3. Obovoid floral bud of *T. Galeottiana*.
4. Younger floral bud of *T. Bartramia* with very deeply cucullate sepals.
5. Broadly obovate petal of *T. bogotensis*.
6. Elliptical to narrowly obovate petal of *T. obscura*.
7. Retrorsely pilosulose spine of *T. semitriloba*.
8. Densely plumose spine of *T. socorrensis*.
9. Irregularly pubescent spine of *T. discolor* with few short hairs.
10. Glabrate spine of *T. paniculata*.



- CC. Fruit with less than 75 falcate, pubescent spines, each about 2-3 mm. long; sepals at anthesis 15-20 mm. long; stamens 20.... 17. *T. Palmeri*
- BB. Petioles generally much longer than 2.0 cm., the leaves ovate (except in *T. obscura*), usually much less than twice as long as broad.
- C. Stamens 20-40 (except *T. Lappula* with 5-15); mature fruit (including spines) 7-15 mm. thick.
- D. Spines plumose or irregularly pubescent; sepals at anthesis 1.2-3.0 cm. long.
- E. Fruit body oblongoid with about 20 spines, each 6-10 mm. long; sepals at anthesis 12-14 mm. long; Revilla Gigedo Islands, Mexico..... 18. *T. socorrensis*
- EE. Fruit body globose with 40 or more spines, each usually 2-5 mm. long; sepals at anthesis 1.5-3.0 cm. long.
- F. Fruit with 40-50 spines; apical appendages of the sepals 5-10 mm. long; stamens about 40.
- G. Spines densely plumose; apical appendages of the sepals 7-10 mm. long; southeastern Mexico..... 19. *T. Purpusii*
- GG. Spines slightly pubescent to nearly glabrate; apical appendages of the sepals 5-7 mm. long; southwestern Mexico..... 20. *T. falcifera*
- FF. Fruit with 75-200 spines; apical appendages of the sepals shorter than 3 mm.; stamens 15-30.
- G. Leaves densely tomentose on both surfaces; mature fruit 6- to 10-loculate, each cell 1-seeded.
- H. Mature fruit 8- or 10-loculate; sepals at anthesis 1.8-2.7 cm. long, the apical appendages 2-3 mm. long.
- I. Mature fruit 5- to 10-loculate, the spines and body very shortly pubescent; sepals broadly obovate, the stamens 25-30; Peru..... 21. *T. multilocularis*
- II. Mature fruit 8-loculate, the spines and body with long plumose hairs; sepals elliptical to narrowly obovate; stamens 20; Colombia..... 22. *T. mollissima*
- HH. Mature fruit 6-loculate; sepals at anthesis about 1.7 cm. long, the apical appendages about 1 mm. long; northeastern Brazil..... 23. *T. longicoma*
- GG. Leaves densely tomentose on lower surfaces only or both surfaces lightly pubescent to glabrescent; fruit with 3, 1- to 2-seeded locules.
- H. Sepals at anthesis 22-30 mm. long; fruit indehiscent insofar as known.
- I. Leaves 11-16 cm. long and 6-9 cm. wide, or slightly larger; fruit stellate-pubescent, spines briefly but distinctly pubescent.
- J. Leaves 3-lobed, without tufts of hairs at axils of the veins on the lower surface; filaments lightly stellate-pubescent at the base; spines very lightly pubescent with short hairs; northwestern Mexico..... 24. *T. chihuahuensis*
- JJ. Leaves not lobed, with many long tufts of hairs at the axils of the veins on the lower surface; filaments not pubescent; spines rather densely pubescent; west-central Mexico..... 25. *T. barbosa*
- II. Leaves 6-8 cm. long and 3-4 cm. wide; fruit tomentose, the spines glabrescent; central and southwestern Mexico..... 26. *T. columnaris*
- HH. Sepals at anthesis 15-20 mm. long; fruit easily dehiscent.
- I. Leaves distinctly longer than broad, gradually and narrowly acuminate, both surfaces lightly pubescent to glabrescent; fruit with 100 or more slender spines, each about 4 mm. long; southern Mexico and West Indies to northern South America..... 27. *T. grandiflora*



- II. Leaves nearly as broad as long, shortly acute to acuminate, tomentose beneath; fruit with about 75 relatively thick spines, each about 2–3 mm. long; northwestern Mexico..... 28. *T. discolor*
- DD. Spines retrorsely pilosulose; sepals at anthesis 3–9 mm. long (except *T. bogotensis* and *T. abutiloides* sometimes up to 13 mm. long).
- E. Petals present; fruit and flower with a 5-glandular gonophore, the urceolus manifest.
- F. Leaves with both stellate and simple hairs, the latter prominent on both surfaces; sepals at anthesis 8–13 mm. long, the petals broadly obovate.
- G. Leaves densely tomentose on both surfaces; apical appendages of the sepals nearly obsolete or less than 1 mm. long; fruit with 6, 1-seeded locules at maturity; Haiti and northern South America..... 29. *T. abutiloides*
- GG. Leaves lightly pubescent on both surfaces; apical appendages of the sepals 2–3 mm. long; fruit with 3, 2-seeded locules at maturity; pantropical..... 30. *T. bogotensis*
- FF. Leaves with stellate pubescence only; sepals at anthesis 5–9 mm. long, the petals linear to narrowly obovate.
- G. Leaves and bracts narrowly elliptical, at least twice as long as broad; northeastern South America..... 31. *T. obscura*
- GG. Leaves ovate, generally 3-lobed, less than twice as long as broad, the bracts elliptical.
- H. Leaves slightly pubescent, glabrescent; petals less than half the length of the sepals; mature fruit body about 3 mm. thick; western Mexico..... 32. *T. acracantha*
- HH. Leaves coarsely stellate-pubescent; petals subequaling the sepals; mature fruit body usually 4 mm. thick or more.
- I. Petioles with 4 prominent glands on the basal sinus; mature fruit 8- to 10-loculate, the spines numerous, about 200; Trinidad and northern South America..... 33. *T. althaeoides*
- II. Petioles without glands at the basal sinus; fruit 3-loculate, the spines 75 or fewer.
- J. Apical appendages of the sepals 2 mm. long or less; fruit body lightly to densely pubescent, spines about 75; pantropical..... 34. *T. semitriloba*
- JJ. Apical appendages of the sepals 3 mm. long or more; fruit body tomentose, the spines 25–40; Ecuador and Peru..... 35. *T. oligacantha*
- EE. Petals absent; gonophore and urceolus obsolete in fruit and flower, the glands absent; pantropical..... 36. *T. Lappula*
- CC. Stamens 5–15; mature fruit (including spines) 4–6 mm. thick.
- D. Sepals very slightly cucullate in younger floral buds; fruit very lightly pubescent.
- E. Leaves densely tomentose on both surfaces, 9–12 cm. long and 7–10 cm. wide; fruit with few, 50 or less, spines, each about 2 mm. long; Colombia and Ecuador..... 37. *T. sericata*
- EE. Leaves lightly pubescent on both surfaces, glabrescent, about 2 cm. long and 1 cm. wide; fruit with numerous, 75–100 short spines, each about 1 mm. long or less; southwestern Mexico..... 38. *T. brachistacantha*
- DD. Sepals cucullate about half their length in young floral buds; fruit densely pubescent.
- E. Floral buds 5–8 mm. long slightly before anthesis, the urceolus manifest, the stamens 10–15; fruit body densely cinereous-tomentose, the spines glabrescent; West Indies and northern South America..... 39. *T. Bartramia*
- EE. Floral buds 3–4 mm. long slightly before anthesis, the urceolus absent, the stamens 5; fruit body and spines densely plumose; northeastern Brazil..... 40. *T. Sampaioi*



- AA. Flowers either hermaphrodite or pistillate, the hermaphroditic buds obovoid, the style about twice the length of the ovary; fruits essentially glabrous.
- B. Leaves 15–18 cm. long and 16–20 cm. wide, 3- to 5-lobed; stamens 30–40; mature fruit body 5–6 mm. thick, the spines 3–5 mm. long; western Mexico..... 41. *T. paniculata*
- BB. Leaves usually 7–15 cm. long and 5–12 cm. wide, not lobed to slightly 3-lobed; stamens 20–30 in hermaphroditic flowers, staminodial or absent in pistillate; mature fruit body 2–4 mm. thick.
- C. Pistillate flower apetalous; (hermaphroditic floral bud 5–7 mm. long slightly before anthesis, the petals about 3–4 mm. long); fruit body 3–4 mm. thick, the spines 30–40; southern Mexico.... 42. *T. Galeottiana*
- CC. Pistillate flower with petals, each about 1 mm. long; (hermaphroditic flower not seen); mature fruit body about 2 mm. thick, the spines about 20; central Mexico..... 43. *T. heliocarpoides*

16. TRIUMFETTA BREVIPES S. Wats. in Proc. Am. Acad. 22:400. 1887. (T.: *E. Palmer* 323).

Spreading bushy shrubs 1–2 m. high; branches and inflorescence axes rough, scurfy, ferruginous-tomentose. Leaves broadly elliptical, about 11–13 cm. long and 3–4 cm. wide, the base obtuse, the tip gradually acuminate, the serrations unequal and blunt, usually glandular, the upper surface lightly but coarsely stellate-pubescent, the lower densely stellate-tomentose; petioles 1.0–1.5 cm. long, densely tomentose. Inflorescences axillary, the cymes of 2, rarely 3, cymules, generally condensed, the flowering peduncles 3–4 mm. long, the pedicels short, about 2 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 1.0–1.4 cm. long at anthesis, slightly constricted in the middle, the apical appendages slender, about 2–3 mm. long, slightly pubescent; sepals oblong, about 13–16 mm. long including the apical appendages, densely tomentose without, glabrescent within; petals narrowly obovate, about 10 mm. long, the claw about 4 mm. long, shortly plumose; gonophore about 1.5 mm. long and nearly as wide, the glands broadly oblong, 1.0–1.5 mm. long and 0.75–1.0 mm. wide; urceolus large, about 1 mm. high or more, indistinctly lobed, slightly ciliate; stamens 25–30, the filaments smooth, without serrations; ovary orbicular, about 1.5 mm. long, the spinules numerous, recurved, the style about 8–9 mm. long, the stigma acute. Fruit orbicular, the body about 6–7 mm. in diameter at maturity, matted cinereous-tomentose, 3-loculate, each cell 1-seeded, the spines numerous, 100 or more, straight, glabrous, each about 1 mm. long; seeds pyriform, 3.0–3.5 mm. long and 2.5–3.0 mm. wide.

A common ground cover in pine and oak forests or rocky hillsides at altitudes of 1000 m. or more in southwestern Mexico; flowering in August and September, the fruit maturing from late September to mid-October.

MEXICO: GUERRERO: Tierras Blancas, Mina, alt. 1400 m., *Hinton* 9922 (GH, US). JALISCO: Río Blanco, *E. Palmer* 323 (GH, US); rocky hills under oaks near Guadalajara, *Pringle* 4502 (BR, GH, Mo, US); barranca of Río Blanco, near Guadalajara, alt. 4500 ft., *Pringle* 11388 (GH, US); near Chapala, *Rose & Painter* 7695 (GH, US). MICHOACAN: road from Tancitaro to Apatzingan, alt. 3400 ft., *Leavenworth* 1771 (Mo); vicinity of Morelia, Loma Sta. Maria, alt. 1950 m., *Arsène* 2516 (K, Mo, P, US); vicinity of Morelia, vers la Huerta, alt. 1950 m., *Arsène* 5131 (GH, Mo, US); vicinity of Morelia, alt. 1900 m., *Arsène* 5546 (GH, Mo, US).



The shortly petiolate elliptic leaves, the orbicular fruit with numerous very short glabrous spines, and the oblongoid floral bud 10–14 mm. long at about anthesis, are characters which distinguish this species.

17. TRIUMFETTA PALMERI S. Wats. in Proc. Am. Acad. 22:400. 1887. (T.: *E. Palmer* 330).

Low shrubs about 1 m. high; branches and inflorescence axes scurfy, ferruginous-tomentose. Leaves narrowly elliptic, about 6–8 cm. long and 2–3 cm. wide, the base obtuse, the tip gradually acuminate, the serrations rather regular and double, the upper surface lightly stellate-pubescent, the lower more densely so; petioles very short, not longer than 1 cm., densely tomentose, nearly obsolete in the bracts. Inflorescences axillary, the cymes usually of 3 cymules, rarely 4, each cymule 2-, rarely 3-flowered, the flowering peduncles variable in length, usually 4–6 mm. long, the pedicels about 2–3 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, 14–18 mm. long slightly before anthesis, usually falcate, the apical appendages short, slender, 1–2 mm. long, slightly pubescent; sepals narrowly ovate, about 15–20 mm. long including the apical appendages, densely tomentose without, glabrescent within; petals about 8–9 mm. long, narrowly obovate, with a claw about 2 mm. long, very densely plumose; gonophore slender, 1.0–1.5 mm. long, the glands oblong, about 1 mm. long and 0.5 mm. wide; urceolus very short, about 0.25 mm. high, rather obscurely 5-lobed, briefly ciliate; stamens 20, the filaments without serrations, slightly pubescent at the base; ovary orbicular, about 1 mm. long, the spinules numerous, recurved, the style 10–12 mm. long, the stigma acute. Fruit orbicular, the body about 4–5 mm. in diameter at maturity, with many short, stellate hairs, 3-loculate, each cell 1-seeded, the spines falcate, about 75, lightly pubescent to retrorsely pilosulose, 2–3 mm. long; seeds pyriform, about 3.0 mm. long and 2.5 mm. wide.

Southwestern Mexico, usually at altitudes of 1000–2000 m.; flowering in mid-August, and the fruit maturing from mid-September to early October.

MEXICO: DURANGO: Sierra Madre, *Rose* 3510 (GH). JALISCO: Río Blanco, *E. Palmer* 330 (Mo, US); on the road between Colotlán and Bolaños, *Rose* 2838 (US); Sierra Madre, west of Bolaños, *Rose* 3701 (US); near Guadalajara, *Rose & Painter* 7447 (US); barrancas near Guadalajara, *Pringle* 4403 (BR, Mo, US); barranca near Río Blanco near Guadalajara, alt. 4500 ft., *Pringle* 11389 (US).

This species is closely related to *T. brevipes*, but may be distinguished from the latter by its floral buds, which are 3–4 mm. longer at about anthesis, and also by its falcate, relatively longer, pubescent spines.

18. TRIUMFETTA SOCORRENSIS T. S. Brandg. in Erythea 7:1. 1899. (T.: *Anthony* 378).

Handsome shrubs about 1.5–2.0 m. high; branches and inflorescence axes rough, scurfy, ferruginous-tomentose. Leaves broadly ovate to rhombic-ovate, about 5–6 cm. long and 4–5 cm. wide, the base rounded or cordate, the tip abruptly acuminate, the serrations very irregular, unequal and blunt, the upper surface coarsely stellate-tomentose, the lower more densely so; petioles about 2.0 cm. long, stout,



densely tomentose. Inflorescences axillary, the cymes of 3–4, very rarely 2, cymules, generally condensed, the flowering peduncles very short, 1–2 mm. long, the pedicels 2–3 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, about 9–11 mm. long slightly before anthesis, very slightly constricted near the base, the apical appendages short, about 1 mm. long; sepals broadly elliptical, about 12–13 mm. long at anthesis including the apical appendages, densely tomentose without, glabrescent and greenish within; petals broadly obovate, about 8–9 mm. long, the claw about 2–3 mm. long, densely plumose; gonophore short and stout, about 0.75 mm. long and 1.5 mm. thick, the glands small, spherical; urceolus short, about 0.5 mm. high, distinctly many-lobed, slightly ciliate; stamens about 20, the filaments glabrous; ovary orbicular, about 1.5 mm. long, the spinules about 30, recurved, the style about 3–4 times the length of the ovary, the stigma very briefly 2-fid. Fruit oblongoid, the body about 3–4 mm. in diameter and 5–6 mm. long at maturity, densely stellate-tomentose, 3-loculate, each cell 1-seeded, the spines about 15–20, 6–10 mm. long, densely pubescent with many short spreading hairs; seeds pyriform, 2.0–3.0 mm. long and 1.5–2.0 mm. wide.

Known only from Socorro Island adjacent to the mainland off the coast of Baja California, Mexico; flowering and fruiting from March to June.

MEXICO: REVILLA GIGEDO ISLANDS: I. Socorro: *Anthony 378* (Mo, NY, UC, US); *Barkelew 197* (Mo, UC, US); Grayson's Cove, *Mason 1672* (Mo, US); dry slopes, north anchorage, *Howell 8444* (US).

A very distinct species and an endemic, it is conveniently recognizable by its densely tomentose, rhombic-ovate leaves with very short petioles, and also by its very characteristic oblongoid fruits with few densely plumose, long spines. In its vegetative and floral characters, it is closely related to *T. brevipes*, a common species of southwestern Mexico, and in its fruit characters to *T. Purpusii*, an endemic from Vera Cruz, Mexico.

19. TRIUMFETTA PURPUSII Standl. in Field Mus. Publ. Bot. 11:167. 1936. (T.: *Purpus 9009*).

Tall sparingly branched shrubs about 1.5 m. high; branches and inflorescence axes rough, scurfy, ferruginous-tomentose. Leaves broadly ovate, about 8–9 cm. long and 4–5 cm. wide, the base subcordate, the tip gradually and narrowly acuminate, the serrations unequal and blunt, generally glandular, the upper surface lightly stellate-pubescent, the lower densely tomentose; petioles 3–5 cm. long, densely stellate-pubescent. Inflorescences axillary, the cymes of 2, rarely 3, cymules, generally condensed, the flowering peduncles about 2–3 mm. long, the pedicels of about the same length. Flowers hermaphrodite, the buds broadly oblongoid, 8–12 mm. long slightly before anthesis, the apical appendages very slender, about 6–10 mm. long, usually reflexed upon the bud, densely plumose; sepals oblong, about 16–20 mm. long including the apical appendages, densely long-tomentose without, glabrescent within; petals obovate to narrowly so, about 6–8 mm. long, the claw about 4 mm. long, densely plumose; gonophore about 1.0 mm. long and 1.5–2.0 mm. wide, the glands large, oblong, 1.0–1.5 mm. long and 0.75–1.0 mm. wide;



urceolus small, about 0.5 mm. high, very deeply many-lobed, lightly ciliate; stamens about 40, the filaments smooth; ovary orbicular, about 1 mm. long, the spinules about 50, recurved, the style about 8–9 mm. long, the stigma acute. Fruit suborbicular, the body about 5 mm. wide, very densely tomentose, 3-loculate, each cell 1-seeded, the spines straight, about 40, each about 2 mm. long, with many long plumose hairs; seeds pyriform, 2.0–2.5 mm. long and 1.5–2.0 mm. wide.

Known only from Vera Cruz, Mexico. Flowers and fruits from November to March.

MEXICO: VERA CRUZ: Mata Zarza, *Purpus* 9009 (FM, GH, Mo, NY, UC, US); barranca de Panoaya, *Purpus* 8609 (GH, Mo, NY, UC, US); Baños de Azufre, *Purpus* 8274 (GH, Mo, NY, UC, US); Remudatero, *Purpus* 11099 (Mo, US).

The presence of very long appendages of the sepals makes *T. Purpusii* and *T. falcifera* very distinct from the rest of the species. This species can be distinguished from the latter, in flower by its calycine apical appendages, which are not only longer by about 2 mm. or more but are also more densely plumose; and in fruit, by the densely plumose body and the spines.

20. TRIUMFETTA FALCIFERA Rose, in Contr. U. S. Nat. Herb. 12:285. 1909. (T.: *E. Palmer* 63).

Bushy shrubs about 2 m. high; branches and inflorescence axes smooth with many long, spreading, stellate hairs. Leaves narrowly to broadly ovate, 12–15 cm. long and 6–9 cm. wide, the base obtuse to subcordate, the tip narrowly and gradually acuminate, the serrations rather regular, generally glandular, the upper surface lightly stellate-pubescent, the lower more densely and softly so; petioles 5–7 cm. long with long, spreading, stellate tomentum. Inflorescences generally axillary, sometimes terminal, the cymes of 1 cymule, the flowering peduncles about 8 mm. long and the pedicels about 6 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 6–10 mm. long at anthesis, the apical appendages very slender, 5–7 mm. long, usually spreading, rather densely plumose; sepals oblong, about 12–16 mm. long including the apical appendages, lightly long-plumose without, brownish and glabrescent within; petals obovate, about 3–4 mm. long, the claw about 1 mm. long, lightly plumose; gonophore about 1 mm. long, nearly 2 mm. wide, the glands narrowly elliptical; urceolus rather short, 0.25–0.5 mm. high, distinctly many-lobed, lightly ciliate; stamens about 40, the filaments glabrous; ovary orbicular, about 1.5 mm. long, the spinules about 40, recurved, the style 6–7 mm. long, the stigma acute, sometimes very briefly 2-fid. Fruit orbicular, about 4 mm. in diameter at maturity, very lightly pubescent, usually 3-loculate, sometimes 4- to 6-celled by false-septation, each cell 1-seeded, the spines about 40, straight, essentially glabrous, each about 2 mm. long; seeds pyriform, 2.0–2.5 mm. long and 1.5–2.0 mm. wide.

Southern Mexico; flowering and fruiting in September and October.

MEXICO: GUERRERO: in Acapulco and vicinity, *E. Palmer* 63 (US), 266 (Mo, UC, US); Baqueta, alt. 200 m., *Langlassé* 502 (P, US); Acapulco, presqu'iles Griffon, *Le Jolis* s. n. (G). TABASCO: Jalapa, Tequisatlán, *Liebmann* 502 (US). DATA INCOMPLETE: *Liebmann* 534A (US).



21. *TRIUMFETTA MULTILOCULARIS* Hochr. in Ann. Conserv. Jard. Bot. Genève 18:104. 1914. (T.: *Pavon s. n.* in Herb. Genève).

Small trees or shrubs 2–4 m. high; branches and inflorescence axes rough, rather densely tomentose, with relatively long, ferruginous, stellate hairs. Leaves broadly ovate, usually 3-lobed, 8–10 cm. long and 6–7 cm. wide, cordate, narrowly and gradually acuminate, the serrations very irregular and rather large, not glandular, the upper surface coarsely stellate-pubescent, the lower more softly and densely so; petioles 4–6 cm. long, rather stout, with many spreading, long, stellate hairs. Inflorescences axillary, the cymes usually of 1, rarely 2, cymules, loose and spreading, the bracts usually broadly ovate, not lobed, the flowering peduncles 8–12 mm. long, the pedicels about 6 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 22–25 mm. long and 3–4 mm. wide slightly before anthesis, the apical appendages rather stout, 2–3 mm. long, lightly pubescent; sepals broadly obovate, about 27 mm. long including the apical appendages, stellate-pubescent without, glabrescent within; petals broadly obovate, showy, about 24 mm. long and 4–6 mm. wide, the claw about 4 mm. long, densely plumose; gonophore large, about 1.5–2.0 mm. long and wide, the glands quadrangular, large, about 1.5 mm. long and 1.0 mm. wide; urceolus 10-lobed, about 0.75 mm. high, distinctly ciliate; stamens 25–30, the filaments retrorsely 2-serrate, slightly pubescent at the base; ovary ovoid, 1.5–2.0 mm. long, the spines numerous, recurved, the style about 22 mm. long, pubescent at the base, the stigma acute. Fruit orbicular, the body about 6–8 mm. in diameter at maturity, lightly and briefly stellate-pubescent, 3- to 5-loculate, each cell 2-seeded, later falsely 8- to 10-loculate, each cell with 1 seed, the spines numerous, short, 1–2 mm. long, very shortly pubescent; seeds ovoid, about 2 mm. long and broad.

Peru; growing at altitudes of 2000–3000 m.; flowering and fruiting from June to December.

PERU: AYACUCHO: between Huanata and Río Apurimac, alt. 2200 m., *Killip & Smith 22309* (US). CUZCO: San Miguel, Urubamba Valley, alt. 1800 m., *Cook & Gilbert 1126, 1163* (US); Prov. Quispicanchis, Dist. Marcapata, *Vargas 9685* (Mo); below Machu Picchu, lower valley slopes, alt. 2100 m., *West 6473* (Mo). HUANUCO: "Fl. de Huayaquil", *Pavon s. n.* (G); "Herbier de Ventenat", *s. n.* (G, FM photo); Acomayo, upon banks of Río Acomayo, alt. 2100 m., *Woytkowski 34013* (Mo). JUNIN: Prov. Tarma, Carpapata, alt. 2400 m., *Ochoa 287* (US); Carpapata, above Huacapistana, alt. 2400 m., *Killip & Smith 24361* (US); Huacapistana, *Rose & Rose 18550* (NY, US); Prov. Tarma, between Palca and Carpapata, alt. 2900 m., *Stork 10970* (Mo). LIMA: Escuela Nac'l. Agric., from Prov. Sandia & Huacapistana and Tarma, *Mexia 4065* (Mo). DATA INCOMPLETE: Amazonian slope of the Andes, alt. 10,000–11,000 ft., *B. Eble s. n.* (NY).

Ornamental shrub or small tree with long whip-like branches. Though sufficiently distinct from *T. mollissima*, it is usually misidentified with it. The much larger flowers with broadly obovate, rather showy petals, and the pubescent to nearly glabrescent fruits, with numerous very short spines, clearly distinguish this species from the former.



22. TRIUMFETTA MOLLISSIMA HBK. Nov. Gen. & Sp. 5:345. 1821. (T.: "S. Fé de Bogota," *Bonpland s. n.* in Herb. Paris.).

*Triumfetta acuminata* HBK. loc. cit. 344. 1821. (T.: *Bonpland s. n.* in Herb. Paris.).

Shrubs about 1–2 m. high; branches and inflorescence axes rough, very densely long ferruginous-tomentose. Leaves broadly ovate to 3-lobed, 12–15 cm. long and 6–8 cm. wide, rounded or subcordate at the base, gradually and narrowly acuminate, the serrations very irregular, blunt and generally glandular, the upper surface scabrous, very pubescent, the lower smooth, densely tomentose; petioles 3–5 cm. long, rather stout, with long spreading ferruginous tomentum. Inflorescences axillary, the cymes of 2–3, rarely 1, cymules, rather lax, the bracts broadly lanceolate to elliptical, long-acuminate, the flowering peduncles about 8 mm. long, the pedicels about 6 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, 15–20 mm. long and about 2 mm. wide slightly before anthesis, the apical appendages slender, 1–2 mm. long, very lightly pubescent; sepals narrowly elliptical, 18–22 mm. long at anthesis, with many long spreading stellate hairs without, glabrescent within; petals linear, 16–18 mm. long, the claw 3–4 mm. long, densely plumose; gonophore rather large, about 1 mm. long and 1–2 mm. wide, the glands quadrangular, large, subequalling the gonophore; urceolus about 1 mm. high, distinctly 5-lobed, densely ciliate; stamens 20, the filaments slightly pubescent at the base, smooth; ovary orbicular, about 2 mm. long, the spinules numerous, recurved, the style 16–17 mm. long, the stigma acute. Fruit orbicular, the body 6–8 mm. in diameter at maturity, densely tomentose with long spreading hairs, 4-loculate, each cell 2-seeded, later falsely 8-loculate with 1 seed to a cell, the spines numerous, 100 or more, each 2–3 mm. long, long-plumose at the base; seeds ovoid, about 2 mm. long and broad.

Known only from Colombia; growing in dry open areas, at altitudes of 1200–2000 m.; flowering and fruiting from May to November.

COLOMBIA: ANTIOQUIA: vic. Medellín, *Toro 117, 501, 701* (NY); Dabeiba, *Johnson & Barkley 18c 676* (US); Bello, alt. 1500–1800 m., *Archer 218* (US). CALDAS: Supia, Cordillera Occidental, alt. 1200–1500 m., *Pennell 10710* (NY). CAUCA: forests in highlands of Popayán, alt. 1700–2000 m., *Lehmann 5521* (NY, US); Tolima, *Lehmann 2196* (G); Río Sucio to Río Piedras, west of Popayán, alt. 1500–1700 m., *Pennell & Killip 8227* (NY); La Manuelita, near Palmira, eastern side of Cauca Valley, alt. 1100–1300 m., *Pittier 818* (US); Municipio Popayán, alt. 1800 m., *Agredo 252* (US); El Tambo, Vertiente Oriental, alt. 1700 m., *Sneidern 4745, 5559, 5671* (US); Popayán, matorrales en Río Blanco, alt. 1800 m., *Arbelaez & Cuatrecasas 5761* (US); El Tambo, *García B. 4418* (US). CUNDINAMARCA: Estacion Santana, arriba de Sasaima, alt. 1600–1700 m., *Dugand & Jaramillo 3845* (US); entre Pandi e Icononzo, alt. 980–1340 m., *García B. 11995* (US); Villeta, *Ariste-Joseph s. n., 5373* (US). DISTRITO FEDERAL: S. Fé de Bogota, *Bonpland s. n.* (P, Mo photo, NY); exact locality lacking, *Bonpland s. n.* (P, Mo photo). VALLE: Palmira, Cordillera Central, alt. 1200–1800 m., *Pennell & Killip 6101* (NY); Pichinde, bank of Río Cali, alt. 1600 m., *Duque 1474* (US); La Cumbre, Cordillera Occidental, alt. 1500–1700 m., *Pennell 5214* (US); Río Bolo, alt. 1000 m., *Dryander 253, 254* (US). DATA INCOMPLETE: *Triana 3230* (US); *Mutis 2788, 4171* (US); Piedra de Moler, *Holton 778* (NY); *Linden s. n.* (NY).



The reason for the discrepancy in the description of the leaf-shape of *T. acuminata* is very obviously due to the fact that the authors mistook the bracts for vegetative leaves. I have seen the types of both *T. mollissima* and *T. acuminata* and am convinced that they are conspecific. The type of *T. mollissima* has both the vegetative leaves and the bracts, while that of *T. acuminata* has only the bracts.

23. TRIUMFETTA LONGICOMA St. Hil. Fl. Bras. Merid. 1:221. 1825. (T.: *St. Hilaire B. 19*).

Older branches smooth, glabrescent, the younger ones and inflorescence axes longitudinally ridged, clothed with long stellate hairs. Leaves broadly ovate, about 8 cm. long and 4–6 cm. wide, cordate, narrowly and gradually long-acuminate, both surfaces with scattered tufts of long stellate hairs, especially on the veins; petioles 2–3 cm. long, slender, with few long stellate hairs. Inflorescences axillary, the cymes of 2–3 cymules, the flowering peduncles 3–4 mm. long, the pedicels 2–3 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, about 15 mm. long and 2–3 mm. wide slightly before anthesis, the apical appendages short, about 1 mm. long, glabrescent; sepals oblong, about 17 mm. long, densely pubescent without with long stellate hairs, glabrescent within; petals obovate, about 14 mm. long and 3 mm. wide, the claw about 2–3 mm. long, briefly ciliate; gonophore stout, about 1.0 mm. long and 1.5 mm. wide, the glands narrowly elliptical; urceolus deeply 5-lobed, about 0.5 mm. high, densely ciliate; stamens about 20, the filaments smooth, glabrous; ovary ovoid, about 1 mm. long, the spinules numerous, recurved, the style about 10 mm. long, the stigma acute. Fruit lightly stellate-pubescent, the body about 5 mm. in diameter at maturity, 3-loculate, each cell 2-seeded, later 6-celled each with 1 seed by false septation, the spines numerous, slender, each about 4 mm. long, lightly pubescent; seeds ovoid, about 2 mm. long and broad.

Apparently a rare species of northeastern Brazil, usually growing along stream-banks in wooded areas at altitudes of about 1000 m.; flowering and fruiting from May to July.

BRAZIL: MINAS GERAIS: Cobras, *St. Hilaire B. 19* (P, FM photo, US); Distr. Diamantina, Christais, near Corrigo Duas Pontes, alt. 1160 m., *Mexia 5821* (NY, US). DATA INCOMPLETE: *Allemao & Sysneiros 1491* (R).

The characters that help in the identification of this species are the long golden-brown silky stellate tomentum, which clothes the younger branches, the inflorescence axes, the outside of the sepals, the leaves and the petioles, the relatively large flowers, and the comparatively long but weak spines. It is quite likely that *T. longicoma* is conspecific with the Old World *T. velutina* Vahl. I have not seen the type of the latter, but have seen a specimen from India in Hooker's Herbarium at Kew, labelled *T. velutina*, which matches well *T. longicoma*.

24. TRIUMFETTA CHIHUAHUENSIS Standl. in Contr. U. S. Nat. Herb. 23:744. 1923. (T.: *M. E. Jones s. n.* in U. S. Nat. Herb.).

Slender spreading shrubs 1–2 m. high; older branches lightly pubescent to





Fig. 8. *Triumfetta chibuabuensis*



nearly glabrate, punctate with prominent white lenticels, the younger stems and inflorescence axes densely pubescent with short stellate and simple hairs. Leaves broadly ovate, generally 3-lobed, 11–14 cm. long and 6–9 cm. wide, distinctly cordate, the middle lobes narrowly and gradually acuminate, the laterals acute to shortly acuminate, both surfaces nearly glabrous, only the primary veins lightly pubescent; petioles slender, 6–7 cm. long, briefly stellate-pubescent. Inflorescences axillary, the cymes of 2–3 cymules, usually opposite the bracts, the flowering peduncles about 5 mm. long, the pedicels 3–5 mm. long. Flowers hermaphrodite, showy, the buds broadly oblongoid, 24–26 mm. long and 3–4 mm. wide slightly before anthesis, the apical appendages about 1 mm. long, glabrescent; sepals oblong, 25–30 mm. long including the apical appendages, scattered stellate-pubescent without, glabrescent within; petals broadly obovate, 20–22 mm. long and 4–5 mm. wide, the claw about 3–5 mm. long, densely but very briefly pubescent; gonophore large, about 2.5 mm. long and 1.5 mm. wide, the glands oblong, about 2 mm. long and 1 mm. wide; urceolus short, distinctly many-lobed, briefly ciliate; stamens 20, the filaments smooth, lightly stellate-pubescent at the base; ovary orbicular, about 2 mm. long, the spinules numerous, recurved, the style about 22 mm. long, the stigma very briefly 3-parted. Fruit orbicular, the body about 6 mm. in diameter at maturity, very lightly stellate-pubescent, 3-loculate, each cell 1-seeded, the gonophore and glands prominent, the spines about 75–100, lightly pubescent with few scattered hairs; seeds ovoid, about 3.5 mm. long and 3.0 mm. wide.

Known only from southwestern Mexico, where it grows along steep, moist, shady canyons in pine forests at altitudes of 1000–1500 m.; flowers and fruits in September and October.

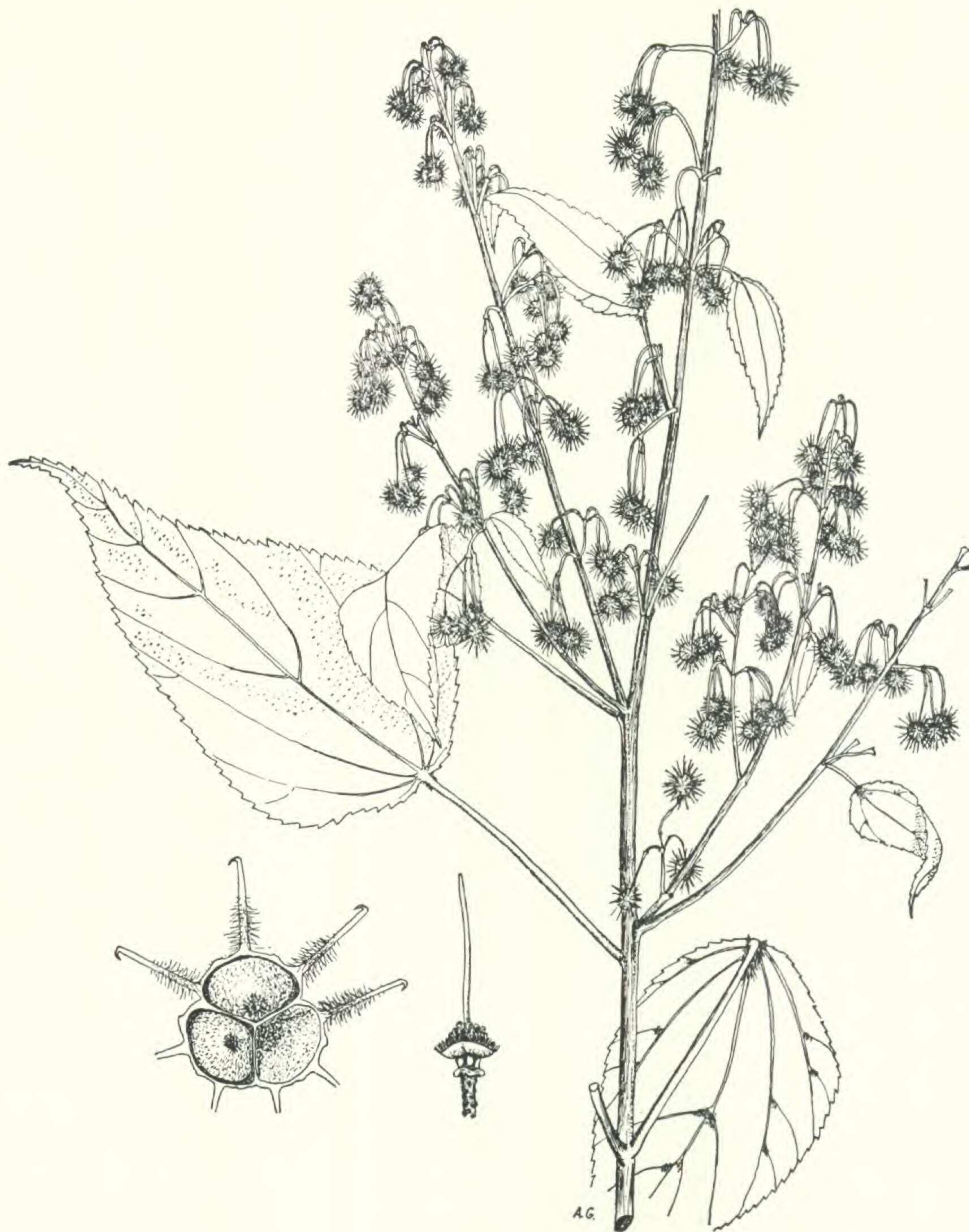
MEXICO: CHIHUAHUA: Guayanopa Canyon, Sierra Madre Mts., alt. 5000 ft., *M. E. Jones s. n.* (Mo, US); near Batopilas, alt. 5500–6500 ft., *Goldman 211* (GH, US); Arroyo Hondo, Sierra Charuco, *Gentry 1780* (Mo, US). SINALOA: Ocurahui, Sierra Surotato, alt. 6000–7000 ft., *Gentry 6240* (Mo). SONORA: Sanguaribo, Río Mayo, alt. 5500 ft., *Gentry 2123* (Mo, US).

This species is rather closely related to *T. columnaris*, but may be distinguished from it by the larger, usually 3-lobed leaves and also by the pubescent spines.

25. **TRIUMFETTA barbosa** Ko Ko Lay, sp. nov.

Frutex circiter 2–4 m. altus. Ramuli graciles longitudinaliter sulcati 4-angulati glabrescentes. Folia late ovata non-lobata 14–16 cm. longa 7–10 cm. lata base cuneata vel rotundata apice longe attenuata subdupliciter serrata pilis sparse stellatis mox glabrescentia infra breviter stellato-pubescentia, in axillis nervorum dense longi-pubescentia. Inflorescentiae axillares, cymis cymulis 2, pedunculis circiter 4 mm. longis, pedicellis 8–10 mm. longis. Flores hermaphroditi, alabastro maturo oblongoideo 18–20 mm. longo; sepalis ellipticis 20–22 mm. longis extra breviter pubescentibus, appendiculis circiter 2 mm. longis glabris; petalis ellipticis vel obovatis 14–16 mm. longis, unguilo 2–3 mm. longo dense plumoso; gonophoro circiter 1.5 mm. longo, glandulis ellipticis 0.75–1.0 mm. longis; urceolo circiter 0.75 mm. alto, 5-lobato breviter ciliato; staminibus 20, filamentis usque ad 12–14



Fig. 9. *Triumfetta barbosa*

mm. longis glabris; ovario globoso circiter 1.5 mm. longo, spinulis 75-100 recurvatis, stylo glabro 15-16 mm. longo, stigmatе acuto. Fructus globosus non dehiscentis, corpore ipso 4-6 mm. diametro, breviter stellato-pubescentis 3-locularis, loculis 1-spermis, aculeis circiter 75, 3-4 mm. longis breviter pubescentibus; seminibus ovoideo-acutis circiter 2 mm. longis et latis.



West-central Mexico.

MEXICO: JALISCO: Sierra Madre Occidental, Real Alto, trail to Arroyo del Jaguay, alt. 2500 m., *Mexia* 1753 (holotype in Herb. Mo. Bot. Gard.; isotypes in Herb. Univ. Mich. and U. S. Nat. Herb.).

A species rather closely allied to *T. chihuahuensis*, but may be distinguished by its undivided long-attenuate leaves with dense tufts of hairs in the axils of the veins on the lower surface, and also by its more densely pubescent spines and glabrous filaments.

26. TRIUMFETTA COLUMNARIS Hochr. in Ann. Conserv. Jard. Bot. Genève 18:111. 1914. (T.: *Hartweg* 448).

*Triumfetta pseudocolumnaris* Hochr. loc. cit. 103. 1914. (T.: *Galeotti* 4151).

*Triumfetta columnarioides* Bullock, in Kew Bull. 292. 1937. (T.: *Hinton* 4917).

Shrubs about 2 m. high; older branches glabrescent, longitudinally ridged, the younger ones and inflorescence axes scurfy, with long spreading stellate and simple hairs. Leaves broadly ovate to obscurely 3-lobed, usually small, 6–8 cm. long and 3–4 cm. wide, rounded or subcordate at the base, gradually and narrowly long-acuminate, both surfaces lightly stellate-pubescent, slightly more so on the veins; petioles relatively stout, about 2–3 mm. long, coarsely long stellate-pubescent. Inflorescences axillary, the cymes of 2 cymules, usually opposite the bracts, the flowering peduncles 4–6 mm. long, the pedicels 3–5 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 22–25 mm. long and about 3 mm. wide slightly before anthesis, the apical appendages slender, 1–2 mm. long, glabrescent; sepals oblong, about 25 mm. long including the apical appendages, glabrescent and brownish without, light yellow within; petals narrowly obovate, about 18 mm. long and 3–4 mm. wide, the claw 4–5 mm. wide, densely but briefly ciliate; gonophore large, about 2 mm. long and 1 mm. wide, the glands oblong; urceolus about 0.5 mm. high, 5-lobed, briefly ciliate; stamens 20, the filaments smooth, long stellate-pubescent at the base; ovary orbicular, about 2 mm. long, the spines numerous, recurved, the stigma very briefly 3-parted. Fruit orbicular, the body about 6 mm. in diameter at maturity, lightly stellate-pubescent, 3-loculate, each 1-seeded, the spines about 75–100, each 1–2 mm. long, lightly pubescent to nearly glabrate, the gonophore and glands prominent; seeds ovoid, about 2.5 mm. long and 1.5–2.0 mm. wide.

Central and southwestern Mexico, usually growing in oak forests, at altitudes of 1500–2500 m.; flowering and fruiting from October to December.

MEXICO: GUERRERO: Mina, Fresnos, alt. 2160 m., *Hinton* 9749 (GH, US); Río Frio Diamantes, Mina, *Hinton* 10734 (GH, Mo, US). MÉXICO: Comunidad, Temascaltepec, alt. 2350 m., *Hinton* 4891 (GH, K, Mo, US), alt. 2300 m., 4917 (Mo, US). MICHOACAN: Sierra Terricillia, Coalcomán, alt. 2420 m., *Hinton* 12349, 15144, 15270 (GH). MORELOS: Cuernavaca, *Holway* 532 (NY). OAXACA: Cordillera, alt. 5000–6000 ped., *Galeotti* 4151 (BR, FM photo); Tokontepeque (Tehuantepec?), *Hartweg* 448 (NY, FM photo); "les montagnes ombragier en terre tempiric," *Gbiesbreght* 175 (P).

The small leaves and large flowers tend to confuse this species with *T. Goldmani*, when examined superficially.



27. *TRIUMFETTA GRANDIFLORA* Vahl, *Eclog. Amer.* 2:34. 1796. (T.: *Ryan s. n.* in Herb. Copenhagen).

*Triumfetta nemoralis* St. Hil. *Fl. Bras. Merid.* 1:221. 1825. (T.: *St. Hilaire B. I.* 1070 in Herb. Paris.).

*Triumfetta longiseta* DC. *Pl. Rar. Jard. Genève*, 64. 1829. (T.: *Burat s. n.* "Havanne" in Herb. Deless.).

*Triumfetta longicuspis* Turcz. in *Bull. Soc. Nat. Moscou* 31<sup>1</sup>:229. 1858. (T.: *Jørgensen* 882).

*Triumfetta cymosa* Tr. & Planch. in *Ann. Sci. Nat. Bot.* IV, 17:353. 1862. (T.: "Quindio," *Triana s. n.* in Herb. Paris.).

*Triumfetta cymosa* var. *glabrescens* Tr. & Planch. loc. cit. 354. 1862.

*Triumfetta cymosa* var. *birsuta* Tr. & Planch. loc. cit. 354. 1862. (T.: "Pampalona," *Triana s. n.* in Herb. Paris.).

*Triumfetta grandiflora* var. *brasiliensis* Hochr. in *Ann. Conserv. Jard. Bot. Genève* 18:100. 1914. (T.: *Glaziov 9356*).

*Triumfetta boyacana* Moldenke, in *Phytologia* 1:10. 1933. (T.: *Laurance 7*).

*Triumfetta Schunkei* Macbr. in *Candollea* 5:381. 1934. (T.: *Schunke 1597*).

Shrubs 1–2 m. high; older branches glabrous, smooth, punctate with small white lenticels, the younger stems and inflorescence axes rough, generally clothed with many long stellate and simple hairs. Leaves broadly ovate, usually about 14 cm. long and 9 cm. wide, sometimes slightly larger, rounded or cuneate at the base, narrowly and gradually long-acuminate, both surfaces glabrescent or lightly scabrous with short stellate hairs, especially on the nerves; petioles slender, about 6–10 cm. long, usually lightly stellate-pubescent. Inflorescences terminal, the cymes of 1–2 cymules, usually opposite the bracts, the flowering peduncles about 6 mm. long, the pedicels 3–5 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 14–18 mm. long and 3–4 mm. wide slightly before anthesis, the apical appendages slender, 1–2 mm. long, glabrescent; sepals linear-ovate, 15–20 mm. long including the apical appendages, glabrescent or lightly ferruginous-pubescent without; petals lanceolate to narrowly obovate, subequalling the sepals, the claw 3–5 mm. long, densely plumose; gonophore about 1.5 mm. long and 2.0 mm. wide, the glands spherical; urceolus about 0.5 mm. high, many-lobed, briefly ciliate; stamens 20, the filaments glabrous, smooth; ovary orbicular, about 2 mm. long, the spinules numerous, recurved, the style 14–16 mm. long, the stigma very briefly 3-parted. Fruit lightly pubescent, the body 5–6 mm. in diameter at maturity, rather easily loculicidally dehiscent, 3-loculate, each cell 2-seeded, the spines numerous, about 200, slender, 4–5 mm. long, lightly pubescent at the base, sometimes with few plumose hairs; seeds pyriform, glabrous, about 2–3 mm. long and 1.5–2.5 mm. wide.

Rather widely distributed throughout the American tropics, though not abundant at any single locality, usually growing at altitudes of about 1000 m.; flowering and fruiting in its northern range from September to December, and in its southern range from March to June.

MEXICO: OAXACA: Sierra San Pedro Nolasco, Talea, *Jørgensen 882, 960* (G); Chinantla, *Galeotti 4162A* (BR, NY, US). VERA CRUZ: Sierra Madre Misantla, *Purpus 6009* (UC).

GUATEMALA: ALTA VERAPAZ: Coban, alt. 1350 m., *Tuerckheim II 861* (BR, GH, Mo), alt. 4300 pp., *Tuerckheim 342* (GH).



PANAMA: CHIRIQUÍ: vicinity of El Valle de Antón, *Allen 2072* (Mo).

CUBA: HAVANA: près de la Havana, *M. Santos-Burat s. n.* (P, Mo photo).

MARTINIQUE: *Sieber 79* (Mo); *Duss 2318* (Mo, NY).

COLOMBIA: BOYACA: region of Mt. Chapon, northwest of Bogotá, *Lawrance 7* (NY, US). SANTANDER: Eastern Cordillera, between El Roble and Tona, *Killip & Smith 19399* (US).

BRAZIL: MINAS GERAIS: Ponte dos Paulistas, Comarca do Cerro do Frio, *St. Hilaire B. I. 1070* (P); Belo Horizonte, *Barreto 7923* (R). RIO DE JANEIRO: Serra de Estrella près de Botequin, *Glaziou 9356* (BR, G); environs de Rio de Janeiro, *Glaziou 17470* (G). DATA INCOMPLETE: *Ryan s. n.* (C, FM photo).

ECUADOR: PICHINCHA: Puente Gloria de María, west of Quito, alt. 1200 m., *Asplund 7250* (US).

PERU: JUNIN: Chanchamayo Valley, alt. 1500 m., *Schunke 1597* (FM). PUNO: Sandia, alt. 2100–2300 m., *Weberbauer 507, 508* (G). DATA INCOMPLETE: *Poeppig 2053* (FM photo).

BOLIVIA: COCHABAMBA: Incachaca-S. Antonio, alt. 1500 m., *Werdermann 2127* (Mo). LA PAZ: Prov. South Yungas, Bassin Río Bopi, San Bartolomé, near Calisaya, alt. 750–900 m., *Krukoff 10246* (Mo); Mapiri, *Bang 1499* (Mo, US); Achiquin, between Mapiri and Apolo, alt. 750 m., *Cardenas 1110* (NY); San Carlos, Mapiri, *Buchtien 1823* (US). TIPUANI: Hacienda Casana, *Buchtien 7368* (US).

The best single character for the identification of this species is its fruits, which are usually rather easily dehiscent at maturity and have numerous, very long slender spines. In flower, it may be recognized by its broadly oblongoid floral buds, which are about 14–18 mm. long and 3 mm. wide at about anthesis. The leaves are broadly ovate and the base is never cordate. There is considerable variation in the pubescence of the leaves; in general, though not always, plants from South America tend to be more pubescent than those from North America.

28. *TRIUMFETTA DISCOLOR* Rose, in *Contr. U. S. Nat. Herb.* 12:285. 1909. (T.: *Rose 1979*).

*Triumfetta debiscens* Rose, loc. cit. 285. 1909. (T.: *Rose 1698*).

Low, spreading, bushy shrubs about 8 dm. high; branches and inflorescence axes rough, scurfy, with many long, spreading, stellate hairs. Leaves broadly ovate to rhombic-ovate, about 7–9 cm. long and 6–8 cm. wide, the base rounded, rarely subcordate, the tip abruptly acute, the serrations unequal, blunt and irregular, the upper surface greenish, with few scattered, short, coarse, stellate hairs, the lower pallid, smooth, with dense stellate tomentum; petioles 3–5 cm. long, clothed with long, spreading, stellate hairs. Inflorescences axillary, rarely terminal, the cymes of 2 cymules, rather lax, the flowering peduncles 3–4 mm. long, the pedicels about 2 mm. long, the subtending bracteoles prominent. Flowers hermaphrodite, the buds oblongoid, about 15–20 mm. long slightly before anthesis, the apical appendages short, about 1 mm. long, lightly pubescent; sepals oblong, about 18 mm. long, brownish and lightly pubescent without, greenish and glabrescent within; petals broadly obovate, about 15 mm. long and 3–4 mm. wide, deep yellow, the claw about 2–3 mm. long, slightly plumose; gonophore broad, about 1 mm. long and 2–3 mm. wide, the glands quadrangular, subequalling the gono-



phore; urceolus prominent, about 0.75 mm. high, many-lobed, densely ciliate; stamens usually 20, rarely 25, the filaments glabrous; ovary orbicular, about 2 mm. long, the spinules numerous, recurved, the style 15–17 mm. long, the stigma acute. Fruit orbicular, the body about 6–7 mm. in diameter at maturity, slightly stellate-pubescent, loculicidally dehiscent, 3-loculate, each cell 2-seeded; spines about 75, about 2 mm. long, lightly pubescent; seeds ovoid, about 1.5–2.0 mm. long and 1.0–1.5 mm. wide.

Western Mexico, usually growing on rocky shaded slopes under oaks or in oak-savannahs at altitudes of 1000–1700 m.; flowering and fruiting from July to September.

MEXICO: DURANGO: Huasemote, *Rose & Hough 3503* (GH, US); along trail from Pueblo Nuevo to Cueva, Sierra Madre Occidental, alt. 1500–1700 m., *Harvey 18486* (US); exact locality lacking, *Rose 2255* (US). JALISCO: in the foothills of Sierra Madre, near Colomos, *Rose 1698* (GH, US). NAYARIT: in the foothills of Sierra Madre, Terr. de Tépico, between Pedro Paulo and San Blascito, *Rose 1979* (GH). SINALOA: Cerro Colorado, alt. 2500 ft., *Gentry 5127* (GH, Mo); Las Mesas, Sierra Surotato, alt. 3000 ft., *Gentry 6150* (GH, Mo), *6151* (Mo, US), *6151a* (Mo); Quebrado de Mansana, Sierra Surotato, alt. 4000–4500 ft., *Gentry 6526a* (GH, Mo); Las Mesas, Sierra Surotato, alt. 3000 ft., *Gentry 6652* (GH, Mo). SONORA: Sierra de Alamos, vicinity of Alamos, *Rose, Standley & Russell 12881* (NY, US).

The lightly stellate, easily dehiscent fruits, the large showy flowers, and the rhombic-ovate leaves with dense tomentum on lower surfaces, characterize this species.

29. TRIUMFETTA ABUTILOIDES St. Hil. Fl. Bras. Merid. 1:223. 1825. (T.: *St. Hilaire s. n.*, "Itajuru de San Miguel de Mato Dentro" in Herb. Paris.).

Sparsely branched, more or less trailing shrubs 1–3 m. high; older branches terete, scurfy, rather densely pubescent with long stellate and simple, frequently gland-tipped hairs, the younger ones and inflorescence axes very densely tomentose with long, spreading, stellate and simple hairs. Leaves broadly ovate, markedly 3-lobate, the lobes usually above the middle of the lamina, 12–14 cm. long and 8–10 cm. wide, the base subcordate, the terminal lobe long-acuminate, the laterals usually blunt, very rarely short-acuminate, the serrations very irregular, the basal ones always glandular, both surfaces densely pubescent with both stellate and simple hairs, the veins densely tomentose, the lower ones very prominent; petioles 3–4 mm. long, stout, densely long-tomentose, usually flattened and forming a callus at the sinus. Inflorescences on terminal branches, the cymes of 3 cymules, always in the axils of the bracts, rather lax, the bracts elliptical, the flowering peduncles about 3 mm. long, the pedicels 3–4 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, about 8–11 mm. long slightly before anthesis, the apical appendages about 1 mm. long; sepals oblong, 8–11 mm. long, grayish and rather densely tomentose without, yellow-brown and glabrescent within; petals subequalling the sepals, broadly obovate, showy, 7–10 mm. long and about 3 mm. wide, the claw 2–3 mm. long, densely plumose; gonophore slender, about 0.5 mm. long, the glands spherical to oblong, subequalling the gonophore; urceolus short,



about 0.5 mm. high, distinctly 5-lobed, densely ciliate; stamens 20, the filaments retrorsely 4-serrate; ovary orbicular, about 1.5 mm. high, the spinules numerous, recurved, the style 5-6 mm. long, the stigma briefly 3-parted. Fruit spheroid, the body rather densely pubescent, 3-5 mm. in diameter at maturity, 3-loculate, each cell with 2 seeds, on maturity with 6 definite 1-seeded locules, the spines 100 or more, each about 3 mm. long, retrorsely pilosulose; seeds lenticular, about 2 mm. long and wide, the funicular groove prominent.

A rather common widespread species of South America, with a few scattered representatives in the West Indies; commonly found in abandoned fields or as a roadside weed at altitudes from about 300 to 1500 m.; flowers and fruits from January to April.

HAITI: Massif de la Selle, Port-au-Prince, alt. 300 m., *Ekman* 7213 (S), 7407 (S).

COLOMBIA: CAUCA: Las Suntas, alt. 300-500 m., *Lehmann* 234 (G). MAGDALENA: Santa Marta, *H. H. Smith* 1689 (NY, US).

VENEZUELA: DISTRITO FEDERAL: in valley, on road from El Valle to Cua, *Pittier* 11974 (G); between Cotiza and Los Venados, near Caracas, *Allart* 21 (US); Caracas and vicinity, *Bailey & Bailey* 257 (US).

BRAZIL: MINAS GERAIS: Caldas, *Regnell* I. 102 (S, US); Dist. Carangola, Fazenda da Gramma, about 6 km. north, *Mexia* 4324 (Mo, US); Caldas, in campo, *Lindberg* 284b (BR, S); Itajuru de San Miguel de Mato Dentro, *St. Hilaire* s. n. (P); Passa Quatro, *Sampaio* 6033, 6118 (R); Domingos Pisoni, Municipio de Leopoldini, *Barreto* 7928 (R); Jard. Bot. de Belo Horizonte, *Barreto* 7922 (R); exact locality lacking, *Claussen* 482 (BR). RIO DE JANEIRO: Nova Friburgo, alt. 900 m., *Holway & Holway* 1459 (US). RIO GRANDE DO SUL: Tristeza, Porto Alegre, *Malme* 1494 (S); Canôas, Prov. Porto Alegre, *Malme* s. n. (S); Cascade, Prov. Gloria, *Malme* 1353 (S). SÃO PAULO: Carapicho, *Mosén* 1132 (S). SANTA CATHARINA: *Ule* 813 (US). DATA INCOMPLETE: *Burchell* 2491 (P).

ECUADOR: GUAYAS: Milagro, alt. 500 m., *Hitchcock* 19960, 20240 (US). MANABI: Portoviejo, *Rose & Rose* 23409 (US).

PERU: CUZCO: Prov. Quispicanchis, Tio, Marcapata, alt. 2000 m., *Vargas C.* 3079 (Mo); Torontoy, Urubamba Valley, alt. 2400 m., *Cook & Gilbert* 819 (US); Santa Ana, alt. 900 m., *Cook & Gilbert* 1437 (US). HUANUCO: Huanuco, *Macbride* 3521 (US); *Macbride & Featherstone* 2053 (US). LORETO: Mishuyacu, near Iquitos, alt. 1000 m., *Killip & Smith* 29894 (US). DATA INCOMPLETE: *Grisar* s. n. (P).

BOLIVIA: LA PAZ: Mapiiri, alt. 2500 ft., *Rusby* 1450 (US); Hacienda Simao sobre el camino a Tipuani, alt. 1400 m., *Buchtien* 5452 (Mo, S, US), 5453, 5454 (US); Caranaim, Tipuani, *Buchtien* 7367 (S, US); Nord Yungas, Milliguaya, alt. 1300 m., *Buchtien* 788 (FM, Mo, S, US); Sirupaya bei Yanacachi, alt. 2100 m., *Buchtien* 509 (US), 510 (S); Villa Aspiazu, *Holway & Holway* 688 (US).

PARAGUAY: L'Asuncion, *Balansa* 2327 (P).

ARGENTINA: FORMOSA: Riocho de Oro, *Reales* s. n. (Mo). MISIONES: Candelaria, Santa Ana, *Schwindt* 49 (Mo); Posadas, *Ekman* 199 (S, US). TUCUMÁN: Tafi, alt. 600 m., *Venturi* 1767 (US).

This species is very closely related to *T. bogotensis*, with which it is often confused. It may, however, conveniently be distinguished from the latter by the very densely pubescent leaves, the short apical appendages of the sepals, and also by the presence of false septa in the fruit, which on maturity becomes completely 6-loculate, each with one seed.

30. TRIUMFETTA BOGOTENSIS DC. Prod. 1:506. 1824. (Based on *T. pilosa* HBK.).

*Triumfetta pilosa* HBK. Nov. Gen. & Sp. 5:343. 1821, non Roth (T.: *Bonpland* s. n. in Herb. Paris.).



- Triumfetta sepium* St. Hil. Fl. Bras. Merid. 1:22. 1825. (T.: *St. Hilaire Al. 156*).
- Triumfetta dumetorum* Schlecht. in Linnaea 11:377. 1837. (T.: *Keerl s. n.* in Herb. Brux.).
- Triumfetta hispida* A. Rich. in Sagra, Hist. Nat. Cuba 10:204. 1839. (T.: *de la Sagra s. n.* in Herb. Paris.).
- Triumfetta grossulariaefolia* A. Rich. loc. cit. 205. 1839. (T.: *de la Sagra s. n.* in Herb. Paris.).
- Triumfetta Lindeniana* Turcz. in Bull. Soc. Nat. Moscou 31<sup>1</sup>:229. 1858. (T.: *Linden 59*).
- Triumfetta Botteriana* Turcz. loc. cit. 32<sup>1</sup>:260. 1859. (T.: *Botteri 773*).
- Triumfetta Orizaba* Turcz. loc. cit. 261. 1859. (T.: *Botteri 771*).
- Triumfetta Josefina* Polak. in Linnaea 41:552. 1877. (T.: *Polakowsky 523*).
- Triumfetta vincentina* Urb. Symb. Ant. 5:414. 1908. (T.: *H. H. & G. W. Smith 1057*).
- Triumfetta valenciensis* R. Kunth, in Fedde's Rep. Sp. Nov. Beih. 43:464. 1927. (T.: *Pittier 8677*).
- Triumfetta panamensis* I. M. Johnston, in Sargentia 8:194. 1949. (T.: *Johnston III2*).

Shrubs about 1–2 m. high; branches and inflorescence axes with many long, spreading hairs. Leaves broadly ovate, usually 3-lobed, 9–10 cm. long and 7–8 cm. wide, the base rounded to subcordate, the tip acuminate, the serrations very irregular, unequal and blunt, both surfaces lightly pubescent with both stellate and simple hairs, the latter prominent, long, either spreading or appressed; petioles about 4–6 cm. long, much shorter in the bracts, very densely tomentose with long simple and stellate hairs. Inflorescences axillary, the cymes of 2 or 3 cymules, the bracts broadly elliptical, the subtending bracteoles prominent, the flowering peduncles 4–7 mm. long, the pedicels 3–4 mm. long. Flowers hermaphrodite, the buds oblongoid, 7–11 mm. long slightly before anthesis, constricted about the middle, the apical appendages slender, 2–3 mm. long, lightly pubescent; sepals oblong, 8–13 mm. long including the appendages, long-hirsute without, glabrescent within; petals broadly obovate, about 8–9 mm. long and 3–4 mm. wide, the claw about 2 mm. long, densely plumose; gonophore slender, about 1 mm. long and 0.5 mm. wide, the glands elliptical, subequalling the gonophore; urceolus short, 0.25–0.50 mm. high, not lobed, distinctly ciliate; stamens 25–30, the filaments glabrous, without serrations; ovary suborbicular, about 1.5 mm. long, the spinules numerous, recurved, the style 8–9 mm. long, the stigma acute. Fruit spheroid, the body about 3–4 mm. in diameter at maturity, 3-loculate, each cell 2-seeded, the spines slender, about 75, retrorsely pilosulose, about 3 mm. long; seeds lenticular, 2–3 mm. long and about 2 mm. wide.

A widespread weedy species of tropical America, which grows in waste lands, cut-over forest areas, and on hill-slopes, up to an altitude of about 2000 m.; flowering and fruiting from late July to early December in its northern range, from October to January in its middle, and from November to April in its southern range.

The appressed simple hairs on both surfaces of the leaves, the broadly obovate petals, and the densely pilosulose spines distinguish this species from *T. semitriloba*.

MEXICO: GUERRERO: Galeana, Carrizo to Pie de la Cuesta, *Hinton 14735* (MICH). JALISCO: Atoyac, *Kerber 135* (G). MÉXICO: Temascaltepec, Bejucos, alt. 610 m., *Hinton 2021* (K). MICHOACAN: Cordillera, alt. 3000 ped., *Galeotti 4156* (BR, P); exact locality



lacking, *Galeotti 4053* (BR, P). OAXACA: near Etna, *Pringle 5718* (MICH); exact locality lacking, alt. 1750 m., *Conzatti & Gonzalez 1054* (GH); *Liebmann 515* (US). TAMAULIPAS: Río de la Ternera, *Purpus 8277* (NY, UC, US); Tampico, *Berlandier 71* (G, FM photo). VERA CRUZ: Jalapa, *F. W. Johnson s. n.* (NY); Jalapa, *Linden s. n.* (K), *59* (G, FM photo), *771* (G, K, P, FM photo, Mo), *772* (P), *773* (K, P, FM photo); Orizaba and vicinity, *Botteri 1089* (US), *Bourgeau 2846* (BR, G, P), *Müller 1600* (BR); Zacuapán, *Galeotti 7040* (BR). YUCATAN: Izamal, *Gaumer 901, 1005* (BR, Mo), *1440* (Mo); Temax, *Gaumer 2130* (Mo); Calotmul, *Gaumer 2131* (BR); Chichankanab, *Gaumer 2035* (Mo); Xnocac, *Gaumer 23469* (Mo). DATA INCOMPLETE: *Linden 79* (BR), *211* (BR); *Hahn 65, 66* (P); *Keerl s. n.* (P).

BRITISH HONDURAS: exact locality lacking, *Peck 240* (K).

GUATEMALA: ALTA VERAPAZ: Cobán, alt. 1350 m., *Tuerckheim II 1957* (BR, Mo), alt. 4300 pp., *Tuerckheim 1359* (Mo); Samac to Chamá, alt. 2500 ft., *H. Johnson 781* (US). DATA INCOMPLETE: *Savage s. n.* (P).

NICARAGUA: SEGOVIA: environ de Granada, alt. 40 m., *Lévy 389* (G, P).

COSTA RICA: ALAJUELA: collins de San Pedro en San Ramon, alt. 1050–1075 m., *Brenes 601* (FM). CARTAGO: northwest slope of Cerro Carpintera, above La Unión, Tres Ríos, alt. 1320–1500 m., *Dodge & Thomas 4828* (Mo). GUANACASTE: defrichements sur les bords du Tiliri, *Tonduz 7208* (BR, GH). HEREDIA: Vera Blanca de Sarapiquí, between Poas and Barba volcanoes, alt. 1710 m., *Skutch 3374* (Mo). SAN JOSÉ: vicinity of El General, alt. 975 m., *Skutch 2914* (GH, Mo); heights of La Carpintera, vicinity of Tres Ríos, *Allen 524* (GH, Mo); Hacienda San Francisco de Guadeloupe, alt. 1150 m., *Pittier 8472* (BR, GH, Mo), *7160* (BR); San José, *Pittier 42* (BR); Piedra Blanca, *Tonduz 1267* (BR). DATA INCOMPLETE: *Tonduz 10925* (BR, GH, K, NY); *Endress 33* (K).

PANAMA: CANAL ZONE: vicinity of Miraflores, *P. & G. White 52* (GH, Mo); Gamboa, *Standley 28511* (GH). CHIRIQUÍ: vicinity of Bajo Mona and Quebrada Chiquero, alt. 1500 m., *Woodson & Schery 592* (Mo); Boquete, alt. 4000 ft., *Davidson 861* (Mo). PANAMÁ: Agricultural Experimental Station at Matías Hernández, *Pittier 6925* (GH, Mo); along the Corozal road, near Panamá, *Standley 26789* (GH); San José Island, about 55 miles s. se. of Balboa, *Johnston 1112* (GH). DATA INCOMPLETE: *S. Hayes 155* (GH), *325* (NY).

CUBA: LAS VILLAS: in Magdalena, Cayamas, *Baker 2490* (UC). ORIENTE: vicinity of Baracoa, *Pollard, Palmer & Palmer 32* (Mo); exact locality lacking, *Ekman 81* (S). PINAR DEL RIO: Sierra de Anafe, *Wilson & Leon 11298* (Mo). ISLE OF PINES: near Nueva Gerona, *Curtiss 234* (Mo).

VIRGIN ISLANDS: SAINT CROIX: Bassin yard, *Ricksecker 80* (Mo), *136* (Mo, NY).

SAINT VINCENT: Chateau Belair, *Beard 1390* (Mo); *H. H. & G. W. Smith 1057* (GH), *1943* (GH).

TOBAGO: Friendship, *R. O. Williams 11041* (TRIN).

TRINIDAD: Laventille Hills near Port-of-Spain, *Broadway 7617* (G, Mo); Chancellor Road, St. Ann, *Broadway 5242* (Mo), *R. O. Williams 11726, 11932* (TRIN); St. Ann, *Broadway 4415A, 4415B* (TRIN); Hort. Trin., Back Lookout, *Broadway 3681* (TRIN).

COLOMBIA: ANTIOQUÍA: Hatillo, *Bro. Daniel 412* (US); Tablaza, Caldas, *Gartner N. 8* (US); vicinity of Medellín, *Robledo & Yepes 24* (US); Medellín, alt. 1500 m., *Archer 730* (US). ATLÁNTICO: Barranquilla and vicinity, *Bro. Elias 699, 1353* (US); Piojó, Los Mameyales, alt. 350–400 m., *Dugand & Garcia B. 2408* (US); Los Pendales, camino a Santacruz, alt. 5–10 m., *Dugand & Jaramillo 2832* (US). BOGOTÁ: prope S. Fé de Bogota, alt. 1360 hex., *Bonpland s. n.* (P, FM photo, Mo); Gachata, alt. 1600 m., *Triana s. n.* (P). BOLIVAR: Carthagena, *Billberg 496* (S). BOYACA: region of Mt. Chapon, extreme western part of Dept. Boyaca, *Lawrance 157* (US). CALDAS: Chinchiná, alt. 1350–1400 m., *Cuatrecasas 23100* (FM). CAUCA: Popayán, alt. 1700–2000 m., *Lebmann 5522* (US), alt. 1740 m., *Lebmann 3553* (G, US); entre Popayán y Cajeti (Hacia Tambo), alt. 1700 m., *Cuatrecasas 13839* (FM). CUNDINAMARCA: La Vega, alt. 1300 m., *Arbelaez & Cuatrecasas 5344* (US); Sasaima, *Bro. José 25E* (US). MAGDALENA: vicinity of Cristobal Colon, *Broadway 294* (US). NORTE DE SANTANDER: region del Sarare, Hoya del Río Chitagá, sobre La Cubaya, alt. 1600–1800 m., *Cuatrecasas, Schultes & Smith 12143* (US); Ocaña, alt. 3500 pp., *Schlim 210* (BR). SANTANDER: northern slope of Mesa de Los Santos, alt. 1000–1500 m., *Killip & Smith 15388* (US). TOLIMA:



La Virginia Libano, alt. 1200–1500 m., *Pennell* 3282 (US). VALLE: norte de Albán, alt. 2100 m., *Dugand & Jaramillo* 3058 (US); La Cumbre, Cordillera Occidental, alt. 1500–1700 m., *Pennell* 5213 (US); Cordillera Occidental, Vertiente Occidental, alt. 1770–2260 m., *Cuatrecasas* 18544, 18623 (FM), 22172 (FM); Alto del Dinde, entre Cartago y Alcalá, alt. 1200–1600 m., *Cuatrecasas* 22919 (FM). DATA INCOMPLETE: *Cuatrecasas* 4682, 7794 (US); *Bro. Heriberto* 479 (US).

VENEZUELA: ARAGUA: Maracay, *Cornelio* 64 (US), *Vogl* 31 (S). CARABOBO: vicinity of Valencia, alt. 400–800 m., *Pittier* 8675, 8677 (US). DISTRITO FEDERAL: Las Adjuntas, *Allart* 506 (G, NY, US); lower Catuche, wood above Caracas, *Pittier* 7535 (US); Caracas and vicinity, *Bailey & Bailey* 286 (US). MERIDA: 3 miles west and 2 miles south of Mérida, *Reed* 308 (US); Tabay, alt. 1800–1900 m., *Gebriger* 447 (G, US); prope coloniam Tovar, *Fendler* 123 (Mo.) MIRANDA: between Las Canales and El Encanto, *Lasser* 671 (US). ZAMORA: La Union, Edo. Bolívar, *L. Williams* 11226 (US).

BRAZIL: BAHIA: Carpicha, *Blanchet* 799 (G); Jacobina, *Blanchet* 3749 (BR, G, Mo). CEARA: exact locality lacking, *St. Hilaire* Al. 156 (P); *Allemao* s. n. (R); *Rocha* 6 (US). PARANÁ: vicinity of Paraná, *Dusén*, 22 (S). PERNAMBUCO: Tapera, *Pickel* 2727, 2727a (US). RIO DE JANEIRO: Serra do Itatiaya, Nopasto, *Sampaio* 4143 (R). RIO GRANDE DO SUL: Porto Alegre, *Reineck & Czermak* 329 (P). SÃO PAULO: vicinity of São Paulo, *Puiggari* 3328 (P), *Vidal* s. n. (R). DATA INCOMPLETE: *Regnell* I 102b (S); Nazareth, *Jobert* III7 (P).

ECUADOR: GUAYAS: vicinity of Guayaquil, *Mille* 8 (NY), 198 (US), *Rose & Rose* 22453 (NY, US); vicinity of La Chonta, *Rose, Pachano & Rose* 23474 (NY, US); 8 km. north of Guayaquil, *Beetle* 8941, 8988 (US); Milagro, alt. 50 m., *Hitchcock* 20220 (US); vicinity of Las Juntas, *Rose, Pachano & Rose* 23302 (US); vicinity of Huigra, *Rose & Rose* 22572 (US).

PERU: CAJAMARCA: San Miguel, Urubamba Valley, alt. 1800 m., *Cook & Gilbert* 891 (US). CUZCO: Prov. Urubamba, Machupicchu, alt. 2100 m., *Vargas* 795 (Mo, US).

BOLIVIA: TARIJA: Carapari, *Fries* 1349 (S).

PARAGUAY: Villa Rica, dans les forets, *Balansa* 2325 (G, P); Caaguazú, *Balansa* 2326 (BR, G, P); Centralis, near Lake Ypacari, *Hassler* 11703 (Mo, US).

ARGENTINA: JUJUY: exact locality lacking, *Fries* 52 (S). MISIONES: San Ignacio, *Quiroga* 7674, 7675 (S).

31. TRIUMFETTA OBSCURA St. Hil. Fl. Bras. Merid. 1:222. 1825. (T.: *St. Hilaire* C282 in Herb. Paris.).

Slender shrubs 1–2 m. high; older branches terete, glabrous, the bark with many shallow, longitudinal ridges, minutely lenticellate, the younger stems and inflorescence axes scurfy, slender with few short, coarse, stellate hairs. Leaves elliptical, more than twice as long as broad, sometimes very obscurely 3-lobed, 11–13 cm. long and 4–6 cm. wide, the base cuneate to rounded, never cordate, the tip gradually and narrowly long-acuminate, the serrations double and rather regular, both surfaces very lightly pubescent with few short, stellate hairs, glabrescent; petioles 3–5 cm. long, slender, scurfy, with many short separate tufts of stellate hairs. Inflorescences axillary, rarely terminal, the cymes of 2–3 cymules, the subtending bracts of the same general shape as the vegetative leaves, the flowering peduncles about 3 mm. long, the pedicels 2–3 mm. long, the bracteoles prominent. Flowers hermaphrodite, the buds narrowly oblongoid, 6–8 mm. long slightly before anthesis, the apical appendages about 1 mm. long, lightly stellate-pubescent; sepals elliptical, 6–9 mm. long, greenish with many short separate tufts of stellate hairs without, brownish and glabrate within; petals linear to narrowly obovate, sub-equalling the sepals, the claw 1–2 mm. long, lightly plumose; gonophore slender,



about 0.5 mm. long, the glands spherical to slightly oblong, about half the length of the gonophore; urceolus short, about 0.25 mm. high, distinctly 5-lobed, lightly ciliate; stamens 20, the filaments retrorsely 4- to 6-serrate; ovary ovoid, about 1 mm. long, the spinules numerous, recurved, the style 5-6 mm. long, the stigma acute. Fruit orbicular, the body 3-4 mm. in diameter at maturity, very lightly pubescent, 3-loculate, each 2-seeded, the spines slender, 100 or more, about 3 mm. long, slightly retrorsely pilosulose; seeds pyriform, small, about 1.5 mm. long and wide, the funicular groove prominent.

Small trailing shrubs usually growing in forests at altitudes of 1000-1500 m., with scattered distribution; flowering and fruiting in its northern range from October to December and in its southern range from January to about the middle of April.

VENEZUELA: MIRANDA: San Antonia, near Las Mostazas, alt. 1200 m., *Allart 266* (NY, US). MONAGAS: between La Sabana de Las Piedras and Cerro Negro, northwest of Caripe, alt. 1200-1500 m., *Steyermark 61822* (FM, Mo).

BRAZIL: DISTRITO FEDERAL: trail between Sylvestre and Paineira, *L. B. Smith 2253* (US). MINAS GERAIS: Fazenda da Cachoeira, Municipio de Tambos, *Barreto 1620* (R). PARANA: Ponta Grossa, in silva, *Dusén 7551* (Mo, S). RIO DE JANEIRO: circa Sabastianopol, *St. Hilaire C2. 82* (P); Sebastianopol, *Martius 87* (BR), *88* (BR, Mo, NY, S); exact locality lacking, *Luschnath s. n.* (S); *Vauthier 431* (G); *Widgren 92* (S). RIO GRANDE DO SUL: Porto Alegre, *Reineck 220* (S). SÃO PAULO: opposite Santos, *Lindberg 692* (BR); Santos, *Mosén 3264* (S); Santa Anna, *Brade 5900* (S). DATA INCOMPLETE: *Ackermann s. n.* (BR); *Burchell 2486* (BR); *Fryer s. n.* (S); *Riedel 109* (BR, S); *Luschnath s. n.* (BR); *Raben 451* (BR).

ARGENTINA: MISIONES: Loreta, in silva, *Ekman 200* (S).

This species may be distinguished from *T. semitriloba* by its narrowly elliptic, nearly glabrate leaves and by the small apical appendages on the sepals. On a fuller knowledge, it is quite possible that *T. obscura* might be assigned a subordinate rank under *T. semitriloba*.

32. TRIUMFETTA ACACANTHA Hochr. in Ann. Conserv. Jard. Bot. Genève 18:111. 1914. (T.: *Langlassé 505*).

Small shrubs about 1.5 m. tall; branches and inflorescence axes smooth, brownish, glabrescent. Leaves ovate-elliptic, slightly 3-lobed, about 10-11 cm. long and 4-5 cm. wide, the base rounded or obtuse, the tip gradually and narrowly acuminate, rather equally and doubly serrate, both surfaces with very few small tufts of stellate hairs, nearly glabrate; petioles slender, about 4-6 cm. long, slightly pubescent. Inflorescences usually axillary, sometimes terminal, the cymes of 2 cymules rather lax, the bracts elliptical to narrowly ovate, the flowering peduncles 2-3 mm. long, the pedicels about 2 mm. long. Flowers hermaphrodite, the buds oblongoid, 7-8 mm. long slightly before anthesis, slightly constricted towards the base, the apical appendages slender, 2-3 mm. long, glabrescent; sepals oblong, about 8-9 mm. long including the apical appendages, lightly stellate-pubescent without and glabrescent within; petals lanceolate, 3-5 mm. long, the claw about 2 mm. long, sparsely plumose; gonophore stout, about 1 mm. long and 1.5 mm. thick, the glands spherical, about 0.75 mm. long; urceolus about 0.5 mm. high,



indistinctly lobed, lightly ciliate; stamens 20, the filaments smooth, slightly pubescent towards the base; ovary ovoid, about 1 mm. long, the spinules numerous, recurved, the style slender, about 6 mm. long, the stigma briefly 3-lobed. Fruit orbicular, the body about 3 mm. thick at maturity, lightly stellate-pubescent, 3-loculate, each cell 2-seeded, the spines slender, about 75, retrorsely pilosulose.

Small shrub of western Mexico growing at low elevations, usually between altitudes of 100 and 200 m.; flowering and fruiting from September to December.

MEXICO: COLIMA: Manzanillo, *E. Palmer 902* (NY). GUERRERO: Baqueta, alt. 200 m., *Langlassé 505* (G, GH, US); Atoyac, Galeana, alt. 160 m., *Hinton 10911* (GH). SINALOA: La Noria, foothills, alt. 800 ft., *Mexia 333* (UC); Capule, alt. 200 m., *Ortega 6083* (US); Ymala, vicinity of Culican, *E. Palmer 1683* (US); vicinity of Culican, *Brandegees s. n.* (UC).

The glabrescent leaves and sepals, together with the regularity and the fineness of the serrations, clearly distinguish this species from *T. semitriloba*.

33. TRIUMFETTA ALTHAEOIDES Lam. Encyc. Meth. 3:420. 1789. (T.: "Cayenne", *Stoupy s. n.* in Herb. Paris.).

*Triumfetta microphylla* Vahl, Eclog. Amer. 2:34. 1796. (T.: "Br. Guyana", *von Robr s. n.* in Herb. Copenhagen).

*Triumfetta surinamensis* Steud. Flora 26:755. 1843. (T.: *Hostmann 605*).

*Triumfetta dichotoma* Turcz. in Bull. Soc. Nat. Moscou 32<sup>1</sup>:261. 1859. (T.: *Regel 12453*).

*Triumfetta semitriloba* var. *surinamensis* (Steud.) Hochr. in Ann. Conserv. Jard. Bot. Genève 18:95. 1914.

*Triumfetta semitriloba* f. *althaeoides* (Lam.) Uittien in Pulle, Fl. Surinam 3:56. 1932.

Bushy, spreading shrubs about 2 m. high; older branches lightly ferruginous-pubescent, the younger ones and the inflorescence axes more densely so, slightly scurfy. Leaves broadly ovate, 12–14 cm. long and 11–13 cm. wide, generally not lobed, sometimes obscurely 3-lobed, the base shallowly cordate, the tip gradually and narrowly acuminate, the serrations rather regular, generally glandular at the base, with 4 prominent glands on the petiole at the basal sinus, the upper surface lightly stellate-tomentose, the lower more densely and coarsely so; petioles 4–6 cm. long, stout, densely tomentose. Inflorescences on terminal branches, the cymes of 3–4 cymules, usually in the axils of the bracts, condensed in dense nodose clusters, the flowering peduncles 3–5 mm. long, the pedicels short, usually 1–2 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, about 6 mm. long at anthesis, the apical appendages about 1 mm. long, nearly obsolete; sepals broadly elliptical, 6–7 mm. long, densely ferruginous-tomentose without, glabrescent within; petals linear, 3–4 mm. long, the claw about 1–2 mm. long, lightly plumose; gonophore stout, about 0.75 mm. long and 1.0–1.5 mm. wide, the glands spherical, small; urceolus short, less than 0.5 mm. high, 5-lobed, lightly ciliate; stamens 20, the filaments glabrous, retrorsely 6-serrate; ovary orbicular, about 1.0 mm. long, the spinules numerous, recurved, the style about 5–6 mm. long, the stigma acute. Fruit orbicular, large, the body 6–8 mm. in diameter at maturity, lightly stellate-pubescent, 4- to 5-loculate, each cell 2-seeded, later falsely 8-loculate with one



Fig. 10. *Triumfetta althaeoides*

seed each, but not more than 6 seeds maturing per fruit, the spines numerous, about 200, slender, about 3 mm. long, retrorsely pilosulose; seeds pyriform, about 2 mm. long and 2.5 mm. wide, the funicular groove rather prominent.

Trinidad and northern South America; commonly growing on loose sandy soil in moist areas, usually at very low elevations, rarely ever being found above an altitude of 200 m.; fruiting and flowering in its northern range from August to November, and in its southern range from April to July.

TRINIDAD: Maraval, *Broadway* 7065 (FM, G, Mo, S); Erin, *Broadway* 7797 (Mo, S); Inois, *Broadway* 8472 (Mo, TRIN); Collins 4411 (Mo, TRIN); Alexander 4597 (TRIN); collector not mentioned, 651, 1106 (TRIN).

COLOMBIA: ANTIOQUIA: La Serrania entre ríos Ariari y Meta, en Angostura, alt. 240 m., *Cuatrecasas* 7782 (US).

BRITISH GUIANA: vicinity of Bartica, on the Essequibo River, *De la Cruz* 1913 (Mo, NY, US); vicinity of Wismar, on the Demerara River, *De la Cruz* 2456 (Mo, NY, US);



Waramuri Mission, Moruka River, Pomeroon Dist., *De la Cruz* 1099 (US), 2563 (Mo, NY, US); Waini River, Northwest Dist., *De la Cruz* 3628 (Mo, NY, UC, US); Wanama River, Northwest Dist., *De la Cruz* 3951 (Mo, US); Moruka River, Pomeroon Dist., *De la Cruz* 4537 (Mo, US); Penal Settlement, *Hitchcock* 17088 (US). DATA INCOMPLETE: *Schomburgk* 81 (P); *von Rohr* s. n. (C, FM photo).

SURINAM: prope Poblebantze, *Kegel* 57 (P); *Hostmann* 605 (Mo, P, U); *Focke* 634 (U).

FRENCH GUIANA: Cayenne, *Sagot* s. n. (P), *Soubirou* s. n. (P), *Jelski* s. n. (S, U); vicinity of Cayenne, *Broadway* 238, 286 (US). DATA INCOMPLETE: *Le Prieur* 117 (P); *C. Richard* s. n. (P); *Leblond* s. n. (P).

BRAZIL: AMAZONAS: Basin of Rio Solimoes, Munic. São Paulo de Olivença, near Palmeres, *Krukoff* 8460 (BR, Mo, NY). BAHIA: Ilhoes, *Curran* 435 (NY, US); *Salzmann* 75 (G, Mo). MARANHÃO: Island of São Luiz, *Fröes* 11838 (US). MATO GROSSO: Cuiabá, *Malme* 1538 (R, S, US); Santa Ana da Chapada, *Malme* s. n. (S). PARÁ: northeast of San Izabel, vicinity of Belem, *F. Drouet* 2042 (Mo, R, US); Ilha do Mosqueiro, near Pará, *Killip & Smith* 30499 (US); Belem, *Dahlgren & Sella* 359, 761 (US), *A. Silva* 9 (US), *Baldwin* 4524 (US); locality not mentioned, *Goeldi* 1097 (NY, US); *Prentiss* s. n. (NY). PERNAMBUCO: Tapera, Recife, *Pickel* 3446 (US). RIO DE JANEIRO: Raiz da Serra de Petropolis, *Gomes* 68 (R). SÃO PAULO: locality not mentioned, *Burchell* 4484, 7218 (BR).

PERU: LORETO: Ost-Peru, Stromgebiet des Maranon von Iquitos, *Tessmann* 3592 (S); Balsapuerto, alt. 220 m., *Klug* 3054 (Mo, US); Mishuyacu, near Iquitos, alt. 100 m., *Klug* 1086, 1289 (US), *Killip & Smith* 27240 (US); Punchana, near Iquitos, *L. Williams* 1316, 1324 (US); Caballo-Cocha on the Amazon, *L. Williams* 2063 (US).

BOLIVIA: COCHABAMBA: exact locality lacking, *D'Orbigny* 596 (P). LA PAZ: Mapiri, *R. S. Williams* 787 (US).

Despite the fact that this species has often been treated as synonymous with *T. semitriloba*, it is definitely not conspecific with it. Its large orbicular 8-loculate fruit with numerous long slender spines, and its broadly ovate, undivided leaves with 4 conspicuous glands on the petiole at the basal sinus are two of the more important characters which aid in distinguishing this weedy species from *T. semitriloba*.

34. TRIUMFETTA SEMITRILOBA Jacq. Select. Stirp. Amer. Hist. 147. 1763. (T.: *Banks Herb.* s. n. in Herb. Riksmuseet, Stockholm).

*Triumfetta triloba* Lam. Ency. Meth. 3:420. 1789. (T.: *Commerson* s. n. in Herb. Paris.). *Triumfetta birta* Vahl, Symb. Bot. Pl. 3:63. 1794. (T.: "St. Martha", *Ryan* s. n. in Herb. Copenhagen).

*Triumfetta rubricaulis* HBK. Nov. Gen. & Sp. 5:342. 1821. (T.: "Caracas", *Bonpland* s. n. in Herb. Paris.).

*Triumfetta havanensis* HBK. loc. cit. 345. 1821. (T.: "Insula Cuba, prope Havanam", *Bonpland* s. n. in Herb. Paris.).

*Triumfetta ovata* DC. Prod. 1:507. 1824. (T.: "Antilles", collector unknown in Herb. Deless.).

*Triumfetta oxyphylla* DC. loc. cit. 508. 1824. (T.: "Novae-Hispaniae", *Sessé & Mocino* s. n. in Herb. Deless.).

*Triumfetta tricuspis* St. Hil. Fl. Bras. Merid. 1:224. 1825. (T.: "Villa-Rica", *St. Hilaire* s. n. in Herb. Paris.).

*Triumfetta acutiloba* DC. Pl. Rar. Jard. Genève, 64. 1829. (T.: "Havanne", *S. Burat* s. n. in Herb. Deless.).

*Triumfetta Thonningiana* DC. loc. cit. 1829. (T.: *Thonning* s. n. in Herb. Deless.).

*Triumfetta tiliaefolia* Vahl ex DC. loc. cit. 1829. (T.: *West* s. n. in Herb. Deless.).



Fig. 11. *Triumfetta semitriloba*

*Triumfetta semitriloba* var. *brasiliensis* K. Schum. in Mart. Fl. Bras. 12<sup>3</sup>:135. 1886. (T.: Blanchet 799).

*Triumfetta semitriloba* var. *Martiana* K. Schum. loc. cit. 135. 1886, in part. (T.: Martius 1263).

*Triumfetta semitriloba* var. *typica* K. Schum. loc. cit. 1886.

*Triumfetta semitriloba havanensis* (HBK.) Millsp. in Field Mus. Publ. Bot. 1:507. 1902.

*Triumfetta semitriloba* var. *Berlandieri* Hochr. in Ann. Conserv. Jard. Bot. Genève 18:95. 1914. (T.: Berlandier 71).

*Triumfetta Sloanei* Fawc. & Rend. in Jour. Bot. 59: 225. 1921. (T.: Ridley s. n. in Herb. Kew.).

*Heliocarpus hirtus* (Vahl) Will. & Sandw. in Fl. Trin. & Tobago 1:111. 1929.

Shrubs 1–2 m. high; older branches terete, glabrescent, the bark reddish, prominently lenticellate, the younger ones and inflorescence axes rough, slender, scurfy,



with short, coarse, stellate tomentum. Leaves generally broadly ovate to 3-lobate, the shape and size extremely variable even on the same plant, usually about 6–8 cm. long and 4–6 cm. wide, the base either cuneate or rounded, very rarely subcordate, the terminal lobe long-acuminate, the laterals usually blunt, but sometimes all 3 lobes narrowly and gradually acuminate, the serrations extremely irregular, usually glandular, both surfaces rather densely and coarsely stellate-pubescent; petioles 3–6 cm. long, slender, scurfy with short, separate tufts of stellate hairs. Inflorescences axillary, rarely terminal, the cymes of 2–3 cymules in the axils of the bracts, the bracts narrowly elliptical, very rarely obscurely 3-lobed, the flowering peduncles 2–3 mm. long, the pedicels about 3 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, about 5–8 mm. long slightly before anthesis, the apical appendages 1–2 mm. long, lightly stellate-pubescent; sepals elliptical, 6–10 mm. long including the apical appendages, greenish and rather lightly stellate-pubescent without, yellow-brown and glabrescent within; petals elliptical to narrowly obovate, subequalling the sepals, the claw 2–3 mm. long, rather densely plumose; gonophore about 0.75 mm. long, rather slender, the glands oblong, about half as long as or subequalling the gonophore; urceolus rather short, 0.25–0.50 mm. high, densely ciliate; stamens 15–25, the filaments glabrous, retrorsely 4-serrate; ovary ovoid, about 1 mm. long, the spinules numerous, recurved, the style 6–8 mm. long, the stigma usually acute, very rarely 3-parted. Fruit orbicular, the body 3–5 mm. in diameter at maturity, lightly to rather densely stellate-pubescent, 3-loculate, each cell 2-seeded, though very rarely all the 6 seeds maturing, the spines 50–75, 2–3 mm. long, slender, retrorsely pilosulose at the base from half to three-quarters of its length; seeds pyriform, about 2 mm. long and wide, the funicular groove prominent.

A common weed of the tropics, which finds its habitat usually in abandoned fields or cut-over forest areas, and in general being a nuisance to both man and his animals, growing from sea-level to about an elevation of 2000 m. It is found principally in the warmer regions of the New World, and less abundantly in tropical Africa. Flowers and fruits in its northern range from October to March, in its central range from December to May, and in its southern range from March to July.

This species may be recognized by its leaves which generally tend to be bluntly 3-lobed, bearing only short, scabrous, stellate hairs on both surfaces, together with either its elongoid flowers, which are 6–10 mm. long with linear-elliptic petals, or its fruits with 3, 2-seeded locules, and about 50–75 retrorsely pilosulose spines.

MEXICO: CAMPECHE: Tuxpeña, *Lundell 953* (Mo). CHIHUAHUA: west of Chuchuchupa, *LeSueur 957* (Mo); Guasaremos, Río Mayo, tropical upper Sonoran margin, *Gentry 1884* (Mo); Hacienda San Miguel, near Batolopes, *E. Palmer 23* (GH, K, US). GUERRERO: Acapulco and vicinity, *E. Palmer 605* (K, Mo, NY, UC). JALISCO: shaded slopes of the barranca near Guadalajara, *Pringle 1756* (BR, K, Mo, MICH); exact locality lacking, *Galeotti 4150* (BR). MORELOS: hills near Yantepec, alt. 4000 ft., *Pringle 9695* (K, Mo). NAYARIT: vicinity of Acaponeta, Tepic, *Rose, Standley & Russell 14212, 14279* (NY); Santiago, Tepic, *Lamb 549* (Mo); Rincon de Mateo, near Yxtlan, alt. 1100 m., *Mexia 775* (Mo); Tepic, *M. E. Jones s. n.* (UC). SAN LUIS POTOSI: en route from San Luis Potosi to Tampico, *E.*



*Palmer 1060* (K, Mo); Tamasunchale, *Kenoyer s. n.* (Mo). SINALOA: Las Mesas, Sierra Suratato, alt. 3000 ft., *Gentry 6623* (Mo). SONORA: Sierra de Alamos, rocky canyon slope, alt. 3000 ft., *Gentry 4867* (Mo); Alamos, *E. Palmer 642* (US). TAMAULIPAS: vicinity of Tampico, *E. Palmer 72* (GH); vicinity of Gómez Farias, alt. 350 m., *E. Palmer 270* (Mo); 10 km. northwest of El Progreso, vicinity of Ocampo, alt. 1450 m., *Stanford, Retherford & Northcraft 1048* (Mo). VERA CRUZ: Cordillera, *Galeotti 7040* (P); exact locality lacking, *Müller 204* (NY), *Gounin s. n.* (P). YUCATAN: exact locality lacking, *Gaumer 24450* (Mo).

GUATEMALA: ALTA VERAPAZ: Cubilquitz, alt. 350 m., *Tuerckheim II 227* (BR, S); Cobán, alt. 4000 ft., *H. Johnson 38* (US). PETEN: La Libertas and vicinity, *Aguilar 188* (Mo).

EL SALVADOR: SAN SALVADOR: vicinity of San Salvador, alt. 650–850 m., *Standley 22685* (NY).

COSTA RICA: data incomplete, *Solis R. 6* (Mo).

BERMUDA: Walsingham, *Harsbberger s. n.* (Mo), *Flynn 76* (Mo).

BAHAMA ISLANDS: New Providence: Nassau, *Hitchcock s. n.* (Mo); *Curtiss II* (Mo).

CUBA: HAVANA: prope Havana, *Bonpland s. n.* (P, Mo photo); Santiago de las Vegas, *Hermann 307* (Mo); La Havanne, *de la Otta s. n.* (Mo photo). LAS VILLAS: Santa Clara, Cieneguita, Dist. Cienfuegos, *Combs 115* (Mo). ORIENTE: *Wright 43* (BR, G, Mo, S); Bayate secus vias, *Ekman 2985* (S), *3413* (S); Sierra de Nipe, El Taller ad Río Piloto, *Ekman 3337* (S).

GRAND CAYMAN: *Hitchcock s. n.* (Mo).

JAMAICA: Port Morant, *Hitchcock s. n.* (Mo); Lucca, *Hitchcock s. n.* (Mo); Farm Hill, *Orcutt 3436* (Mo); mountains near Kingston, *Hansen s. n.* (Mo); *Cumming s. n.* (G); Porto Antonio, *Hitchcock s. n.* (Mo); Lloyd, *Hitchcock 1014* (Mo); Constant Spring, *Ridley s. n.* (K).

HAITI: La Tortue, between Palmiste and Embouchure de la Thochelle, *Ekman 4184* (S); La Tortue, main ridges at Binquette, *Ekman 4229* (S); Roseaux, valley of Roseaux River, *Seibert 1774* (Mo); prope Sarrasin, *Buch 586* (S).

DOMINICAN REPUBLIC: Dist. Moncion, Prov. Monty Cristy, alt. 375 m., *Valeur 411* (Mo); "Sylvania", alt. 1500–1800 ft., *Cooper III 25* (Mo, NY); St. Domingo City, at Guibia, *Ekman 10945* (S); St. Cristobal, *Tuerckheim 2623* (BR, Mo, S).

PUERTO RICO: Ciales, Bayamon, *Otero 363* (Mo); Rincon, ad Tuntas, *Sintenis 5652* (Mo); near Mayaguez, *Thevshohn 30* (Mo), *Blauner 171* (G), *Heller 4444* (Mo).

VIRGIN ISLANDS: SAINT THOMAS: Signal Hill, alt. 1200 ft., *Eggers s. n.* (Mo). SAINT CROIX: Bassin, *Ricksecker 138* (Mo), *225* (FM); *Thompson 1018* (S).

FRENCH WEST INDIES: SAINT BARTHELEMY: *von Goes s. n.* (S); *Forström s. n.* (S). GUADELOUPE: Pointe-à-Pitre, *Hammarlund 29* (S); Cascade Vaugelé, *Picard s. n.* (P); *Beaupertuis s. n.* (P). MARTINIQUE: *Belanger 560, 647* (P); Fort Royal, *Plée s. n.* (P).

SAINT VINCENT: near Kingstown, *Eggers 6940* (S).

BARBADOS: *Wright s. n.* (BR).

TOBAGO: Highmoor, *Broadway 3407* (Mo).

TRINIDAD: *Kuntze 661* (US).

COLOMBIA: MAGDALENA: exact locality lacking, *Bertero s. n.* (Mo).

VENEZUELA: DISTRITO FEDERAL: Los Venados, near Caracas, *Allart 93* (G, NY, US); near Caracas, alt. 450 m., *Bonpland s. n.* (FM photo, Mo). MERIDA: 3 miles west, 2 miles south of Mérida, *Reed 306* (US); near Galipan, on the bank near water, *Pittier 213* (G). MIRANDA: vicinity of Petare, along hills, *Pittier 9894* (G); Hacienda Paloma, alt. 900 m., *Pittier 13052* (GH, Mo, NY, US); in valley on road from El Valle to Cua, along the river, *Pittier 11974* (Mo).

BRAZIL: BAHIA: exact locality lacking, *Blanchet 3117* (G); *Luschnath 163* (BR). DISTRITO FEDERAL: Trapicheiro, *Lutz s. n.* (R). MINAS GERAIS: Campo Tiririca, alt. 590 m., *Mexia 5663* (Mo, R, US); Lagoa Santa, *Da Costa s. n.* (R); Serre Negra, *St. Hilaire 98* (P); Viçosa, Chacha Valley, *Mexia 4733* (Mo, US); exact locality lacking, *Claussen s. n.* (NY), *Martens s. n.* (BR). PARANA: Morretes, Estrada da Graciosa, Grota Funda, *Hatschbach 908* (US). RIO DE JANEIRO: Nova Friburgo, Estrada de Conego,



*Velloso s. n.* (R); Corcovado, *Saldanha 224, 649* (R); Petropolis, *Sampaio 7692* (R); Campos, *Sampaio 8300* (R); Ipanema, *Diogo 52* (R); Teresopolis, *Emygdio s. n.* (R); Matas do Rio Trapicheiro, *Freire & Peckolt 612, 613* (R). SÃO PAULO: Horto Florestal de Loreto, *Sampaio 4306* (R); Jaraguá, *Brade 5897* (S). DATA INCOMPLETE: *Regnell II 286* (S); *Urteri 12* (G).

ECUADOR: GUAYAS: 21 km. southwest of Guayaquil, alt. 40 m., *Worth, Morrison & Horton 8941* (Mo); Sudl. Naranjapata, alt. 550 m., *Schimpff 587* (Mo, US).

PERU: LIMA: exact locality lacking, *Anderson s. n.* (S). LORETO: lower Río Huallaga, *L. Williams 4360* (US). SAN MARTIN: San Roque, alt. 1350–1500 m., *L. Williams 7160* (US).

BOLIVIA: BENI: Río Chaparé-Mamoré, alt. 250 m., *Werdermann 2166* (Mo); vicinity of Reyes, alt. 1000 ft., *Cardenas 1377* (NY). COCHABAMBA: Prov. Chapare, Wegerand, Socotol, alt. 1500 m., *Steinbach 9089* (S). LA PAZ: Yungas, *Bang 465* (FM, Mo); Mapiri, alt. 2500–5000 ft., *Rusby 1236a* (NY); Prov. Larecaja, near Sorata, alt. 2550 m., *Mandon 826* (BR, NY, S), *827* (G, S); Apolo, *R. S. Williams 193* (NY, US); Polo-Polo bei Coroico, alt. 1100 m., *Buchtien 3840* (S). SANTA CRUZ: Prov. Sara, Buena Vista, Barbechos, Río Surutú, alt. 400 m., *Steinbach 5545* (G, Mo, S); Buena Vista, Orillabasque, alt. 450 m., *Steinbach 7118, 7416* (Mo, S). DATA INCOMPLETE: *Fries 1506, 1506a* (S).

PARAGUAY: Villarica, *Jørgensen 3858* (Mo, S, US); exact locality lacking, *Morong 132* (NY).

ARGENTINA: JUJUY: en las Cercanias, *Lorentz & Hieronymus 1009* (S); Humahuaca, alt. 2800 m., *Venturi 8369* (S, US); Humahuaca, alt. 3020 m., *Claren 11715* (S). MISIONES: Santa Ana, *Rodriguez 231* (Mo).

35. TRIUMFETTA OLIGACANTHA Hochr. in Ann. Conserv. Jard. Bot. Genève 18:106. 1914. (T.: *Pavon s. n.* in Herb. Deless.).

Small shrubs; branches and inflorescence axes smooth, scurfy, ferruginous-tomentose. Leaves broadly ovate, about 9–10 cm. long and 6–8 cm. wide, the base obtuse, the tip gradually long-acuminate, the serrations rather regular, the basal ones generally glandular, the upper surface lightly stellate-pubescent, the lower more densely so; petioles about 3–6 cm. long, densely pubescent. Inflorescences axillary, the cymes of 3–4 cymules, rather lax, the flowering peduncles about 8–10 mm. long, the pedicels 3–5 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 6–8 mm. long slightly before anthesis, slightly constricted in the middle, the apical appendages large, about 3 mm. long, slightly pubescent; sepals oblong, 8–11 mm. long including the apical appendages, densely tomentose without, glabrescent within; petals narrowly obovate, 6–7 mm. long, the claw 2–3 mm. long, shortly plumose; gonophore slender, about 0.75 mm. long, the glands narrowly elliptical; urceolus small, about 0.5 mm. high, indistinctly lobed, slightly ciliate; stamens about 30, the filaments smooth, glabrous; ovary small, orbicular, about 1 mm. long, the spinules about 35, recurved, the style about 8–9 mm. long, the stigma acute. Fruit orbicular, the body about 2–3 mm. in diameter at maturity, matted cinereous-tomentose, 3-loculate, each cell 1-seeded, the spines 25–40, 2–3 mm. long, retrorsely pilosulose; mature seed pyriform, about 1.5 mm. long and wide, the funicular groove prominent.

Known only from a few collections, mostly from Ecuador, and one (the type) probably from Peru. Apparently rare plants, which are usually found at low elevations. Flowering and fruiting from June to October.



ECUADOR: GUAYAS: Duran, Westabhang, alt. 40 m., *Schimpff 1078* (Mo); Guayaquil, alt. 50 m., *Hitchcock 20153* (US). DATA INCOMPLETE: Terecita, *Stevens 161* (US); *Fraser s. n.* (G).

PERU (?): *Pavon s. n.* (G).

Though rather poorly represented in the herbaria, this is one of the more distinct species in the "*semitriloba* complex." It is easily identified by its undivided, caudate-acuminate leaves, by its relatively long apical appendages of the sepals, and also by its fruits, which have only a few (25–40) spines.

36. TRIUMFETTA LAPPULA L. Sp. Pl. ed. 1. 444. 1753.

*Triumfetta heterophylla* Lam. Encyc. Meth. 3:420. 1789. (T.: "St. Domingo", *Poiteau s. n.* in Herb. Paris.).

*Triumfetta sinuosa* Miq. in *Linnaea* 22:466. 1849. (T.: *Kappler 1589*).

*Triumfetta Hostmanni* Miq. loc. cit. 1849. (T.: *Hostmann 499*).

*Triumfetta Berteri* Turcz. in *Bull. Soc. Nat. Moscou* 31<sup>1</sup>:227. 1858. (T.: *Bertero s. n.* in Herb. Paris.).

*Triumfetta Salzmanni* Turcz. loc. cit. 229. 1858. (T.: *Salzmann s. n.* in Herb. Paris.).

*Triumfetta quinqueloba* Turcz. loc. cit. 36<sup>1</sup>:574. 1863. (T.: *Mathews 1625*).

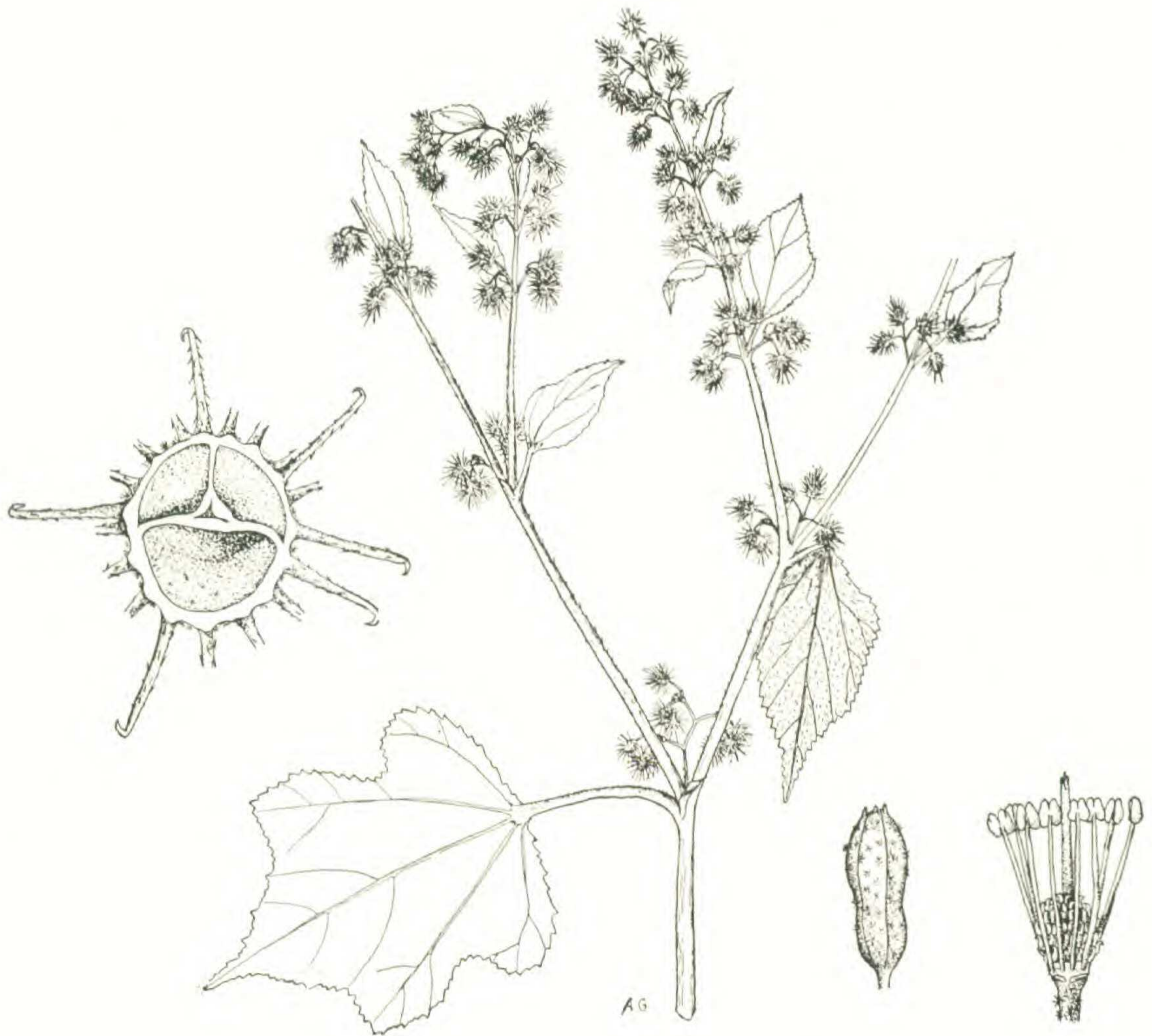


Fig. 12. *Triumfetta Lappula*



Tall weedy shrubs about 1–2 m. high; branches and inflorescence axes with coarse, scurfy, ferruginous tomentum. Leaves broadly ovate, usually pandurate, 3- to 5-lobed, about 8–10 cm. long and 7–9 cm. wide, the base obtuse to rounded, the tips acuminate, the serrations usually glandular, unequal and blunt, the upper surface lightly pubescent, the lower lightly tomentose to more densely so; petioles usually 6–8 cm. long, sometimes slightly longer, usually thick, very densely and coarsely pubescent. Inflorescences axillary, the cymes of 2, rarely 3, cymules, generally condensed, the bracts elliptical, very rarely obscurely 3-lobed, the flowering peduncles about 2–3 mm. long, the pedicels short, 1–2 mm. long. Flowers hermaphrodite, the buds narrowly oblongoid, 3–5 mm. long slightly before anthesis, slightly constricted in the middle, the apical appendages very short, rarely absent; sepals oblong, about 4–6 mm. long, densely stellate-tomentose without, glabrescent and yellowish within; petals absent; gonophore obsolete, the glands absent; urceolus very small, nearly obsolete, not ciliate; stamens usually 10, rarely 15 or 5, the filaments glabrous, smooth; ovary ovoid, about 1.0–1.5 mm. long, the spinules numerous, recurved, the style about 3 times the length of the ovary, the stigma acute, sometimes very briefly 2-fid. Fruit orbicular, the body about 3 mm. in diameter at maturity, lightly stellate-pubescent, 3-, sometimes 2-, loculate by abortion, the spines about 50, slender, 2–3 mm. long, retrorsely pilosulose; seeds pyriform, about 1.5–2.0 mm. long and 1.0–1.5 mm. wide.

A widespread species found abundantly in the tropical Americas and less so in the eastern hemisphere. Usually growing in open places and a nuisance in cultivated paddocks, it finds its habitat from sea-level to an altitude of about 2000 m. Flowers and fruits from late November to early March.

The absence of petals, gonophore, and urceolus in flower, and the retrorsely pilosulose spines, the small body and the absence of glandular gonophore in fruit, are some of the more constant characters which facilitate the identification of this species.

MEXICO: CAMPECHE: Tuxpeña, *Lundell 1188* (Mo). CHIAPAS: Escuintla, *Matuda 97* (Mo). YUCATAN: exact locality lacking, *E. P. Johnson 58* (NY).

BRITISH HONDURAS: Mullins River road, alt. 100 ft., *Schipp 868* (Mo).

HONDURAS: MORAZÁN: Francisco, along Yeguaré River, alt. 900 m., *Williams & Molina 12202* (Mo). ATLANTIDA: above San Juan, west of Tela, *Yuncker 4810* (Mo).

EL SALVADOR: SAN SALVADOR: vicinity of San Salvador, alt. 650–850 m., *Standley 19091* (Mo).

NICARAGUA: CHINANDEGA: near Chinandega, *Baker 2247* (K, Mo); Volcán El Viejo, *Baker 17* (Mo). GRANADA: envr. de Granada, alt. 410 m., *Lévy 399* (G, P).

COSTA RICA: GUANACASTE: buissons autour de Nicoya, *Tonduz 13491* (G, NY, P, US). SAN JOSÉ: taillis du Rodeo de Pacaca, alt. 900 m., *Pittier 3258* (BR); au Rodeo, alt. 700–1000 m., *Pittier 1630* (BR); vicinity of El General, alt. 880 m., *Skutch 3028* (Mo). DATA INCOMPLETE: près San Mateo, alt. 200 m., *Biolley 7059* (BR); brussailles du Río Ceibo, alt. 200 m., *Pittier 6693* (BR).

PANAMA: BOCAS DEL TORO: vicinity of Chiriquí Lagoons, Old Bank Island, *Wedel 1883, 1949, 2005* (Mo); Water Valley, *Wedel 1710, 1779, 1825, 1847, 1854* (Mo); Darkland, *Wedel 2618* (Mo); Boca, littoral Atlantique, *Tonduz 9153* (BR). CANAL ZONE: Barro Colorado Island, *Shattuck 728* (Mo); vicinity of Miraflores Lake, *P. White 279* (Mo); Ancón Hill, alt. 600 ft., *R. S. Williams 21* (NY); vicinity of San Carlos, alt.



10 m., *Allen 1138* (Mo); Chagres, Isthmus of Panama, *Fendler 172* (Mo); hills between Capira and Potrero, alt. 80–130 m., *Dodge & Hunter 8626* (Mo). DATA INCOMPLETE: *S. Hayes 321, 370, 991, s. n.* (NY); *Mell s. n.* (NY).

CUBA: SANTA CLARA: Colonia Limones, Ingenio Soledad, near Cienfuegos, *Pringle 93* (Mo). ORIENTE: Santiago de las Vegas, *Baker 84* (Mo, NY, P, U); Cooper's Ranch, base of El Yunque, Mt. Baracoa, *Underwood & Earle 578* (NY). DATA INCOMPLETE: *Serre s. n.* (BR).

ANTIGUA: *Wullen s. n.* (BR).

GRAND CAYMAN: *Hitchcock s. n.* (Mo).

JAMAICA: Gray's Inn, *Orcutt 4664* (Mo); above Kingston, *Lehmann 1292* (NY); Port Morant, *Hitchcock s. n.* (Mo); Constant Springs, *Hitchcock s. n.* (Mo).

DOMINICAN REPUBLIC: Sonador, Bonaó, La Vega, alt. 180 m., *Valeur 381* (Mo, NY); prope Barahona, *Fuertes 179* (Mo).

PUERTO RICO: on the Adjuntas road, 7 miles from Ponce, *Heller 6184* (Mo); Bayamon District, Santurce, *Otero 462* (Mo); Signal Hill, alt. 1100 m., *Eggers s. n.* (Mo).

VIRGIN ISLANDS: SAINT THOMAS: *Eggers 58* (S); *Krebs s. n.* (U). SAINT CROIX: Bassin yard, *Ricksecker 135* (Mo); *Benzon s. n.* (Mo).

MARTINIQUE: *Duss 1363* (Mo); *Belanger 31* (P); *Hahn 224* (P).

TOBAGO: Rocky Vale, *Broadway 3383* (Mo, S); near the Yaws Hospital, Scarborough, *Broadway s. n.* (Mo); top of Lambeau, near King's Bay, *Freeman 10254* (Mo, TRIN).

TRINIDAD: road to Blue Bassin, *McLean 7725* (Mo, TRIN); Carenage, *Fitzsimmons 3847* (TRIN); *Collins 4433* (TRIN); Chancellor's Road, *Broadway 10253* (TRIN); Diego Martin, *Reece s. n.* (TRIN); near Williamsville, *Broadway 9362* (G, U); Moruga, *Britton & Broadway 2454* (US); *Salzmann 250* (Mo).

COLOMBIA: ATLÁNTICO: Los Pendales, Hacienda Ríodulce, alt. 20–50 m., *Dugand & Jaramillo 4139* (US); Los Pendales, cerca de la laguna de Sábalo, alt. 10–30 m., *Dugand & Jaramillo 2704* (US). CAUCA: Popayán, *Garcia B. 4493* (US). LOS LLANOS: Int. El Meta, Villavicencio, alt. 500 m., *Cuatrecasas 4528, 4683* (US). MAGDALENA: Poponte, Magdalena Valley, *Allen 792* (Mo); Curinquita, *H. H. Smith 1908a* (NY). NORTE DE SANTANDER: region del Sarare, El Blanco, confluencia de los ríos Cubugón y Cobaría, alt. 320 m., *Cuatrecasas 13153* (US). SANTA MARTA: exact locality lacking, *H. H. Smith 1690* (BR, Mo, US). TOLIMA: Falán, region de Calamonte, alt. 1120 m., *Garcia B. 8380* (US). VALLE: plano del Valle del Cauca, entre Cabuyal y La Solorza, alt. 1000 m., *Cuatrecasas 14439* (FM, US); Río Canaveralejo, alt. 100 m., *Dryander 2232* (US).

VENEZUELA: DISTRITO FEDERAL: Cordillera del Avila, dry south-facing slopes above Caracas, alt. 1065–1520 m., *Steyermark 55179* (FM, Mo); Puerto La Cruz, alt. 10 m., *Pittier 11640* (G, US); La Guaira, *Boldingh s. n.* (U). MÉRIDA: prope coloniam Tovar, *Fendler 1918* (K). MIRANDA: La Malva near Las Mostazas, *Allart 278* (G, NY, US). SUCRE: Paria Peninsula, Cariaquita, *Bond, Gillin & Brown 5* (US). TRUJILLO: La Concepcion, alt. 2500 ft., *Reed 1041* (US); vicinity of Cristobal Colon, Aricagua, *Broadway 174, 405* (US). DATA INCOMPLETE: *Mathews 1625* (K).

BRAZIL: MARANHÃO: Island of São Luiz, *Froes 11839, 11852* (US). PARÁ: Boa Vista, *Carr s. n.* (US); exact locality lacking, *Sieber s. n.* (BR). DATA INCOMPLETE: *Martius A. 1264* (Mo).

ECUADOR: GUAYAS: Milagro, alt. 50 m., *Hitchcock 20221, 20239* (US). JUNIN: La Merced, alt. 700 m., *Killip & Smith 23419* (US).

PERU: LORETO: Balsapuerto, alt. 200 m., *Klug 3093* (Mo, US). SAN MARTIN: Chazuta, Río Huallaga, alt. 260 m., *Klug 4150* (Mo, US); Iquitos, alt. 100 m., *Killip & Smith 27234* (US).

BOLIVIA: COCHABAMBA: vicinity of Guanai, *Bang 1597* (Mo, S, US). LA PAZ: Charopampa, Mapiri, *Buchtien 1825* (US).

### 37. *TRIUMFETTA sericata* Ko Ko Lay, sp. nov.

Frutex circiter 1.5–2.0 m. altus. Ramuli graciles dense pubescentes pilis ferrugineis et stellatis et simplicibus. Folia late ovata vel profunde 3-lobata 9–12 cm. longa 7–10 cm. lata base rotundata vel subcordata apice longe acuminata



margine irregulariter serrata interdum glandulosa utrinque scabratis pilis dense canescenti-tomentosis; petiolis 7–10 cm. longis dense tomentosis. Inflorescentiae terminales, cymis cymulis 5–6, bracteis ovatis vel obscure 3-lobatis, pedunculis 2–3 mm. longis, pedicellis 2–4 mm. longis. Flores hermaphroditi, alabastro maturo oblongoideo 6–8 mm. longo; sepalis ellipticis circiter 8 mm. longis extra longe et dense stellato-tomentosis, appendiculis circiter 2 mm. longis dense plumosis; petalis ellipticis 6–7 mm. longis, unguilo circiter 2 mm. longo extra breviter plumoso; gonophoro 0.25–0.5 mm. longo, glandulis quadrangularibus circiter 0.1 mm. latis; urceolo 0.25 mm. alto non-lobato breviter ciliato; staminibus 15, filamentis usque ad 5–6 mm. longis glabris; ovario ovoideo 0.5–1.0 mm. longo, spinulis 40–50 recurvatis, stylo glabro 6–7 mm. longo, stigmatibus acute vel breviter 3-fido. Fructus globosus non dehiscens, corpore ipso 2–3 mm. diametro breviter stellato-pubescentis mox glabrescens, 3-locularis, loculis 1-spermis, aculeis circiter 50, 2.0–2.5 mm. longis irregulariter plumosis; seminibus ovoideo-acutis circiter 0.75 mm. longis et latis.

Northwestern South America growing in open places at altitudes of 1000 to 1300 m.; flowering and fruiting from August to early December.

COLOMBIA: CAUCA: La Manuelita, near Palmira, eastern side of Cauca Valley, alt. 1100–1300 m., *Pittier 794* (NY, US); El Bordo, *Garcia B. 4472* (US). CUNDINAMARCA: El Colegio, *Joseph s. n.* (US). TOLIMA: Honda, *Joseph s. n.* (US). VALLE: Municipio de Candelaria, sur de Palmira, alt. 1200 m., *Nuñez, Araque & Barkley 18. VC. 025* (holotype in Herb. Mo. Bot. Gard. and isotype in U. S. Nat. Herb.).

ECUADOR: exact locality lacking, *Jameson s. n.* (US).

The densely tomentose leaves, the small oblongoid floral buds in dense nodose clusters, the 15 stamens and the small, dark, very lightly pubescent fruits distinguish this species. Though it has a striking superficial resemblance to *T. abutiloides*, it is not closely related to it. Its relationship with any known South American species is rather doubtful. However, it is closest to *T. brachistacantha*, known only from Oaxaca, Mexico.

38. TRIUMFETTA BRACHISTACANTHA Standl. in Field Mus. Publ. Bot. 11:167. 1936. (T.: *Bossé 8019*).

Older branches glabrate, longitudinally ridged, with many prominent white lenticels, the younger stems and inflorescence axes terete, lightly stellate-pubescent. Leaves broadly ovate, small, 1.5–2.0 cm. long and about 1.0 cm. wide, obtuse to subcordate at the base, gradually and narrowly acuminate, rather regularly and doubly serrate, the upper surface lightly stellate-pubescent, the lower more densely so; petioles short, usually not longer than 1 cm., lightly stellate-pubescent. Inflorescences axillary, the cymes of 1 or 2 cymules, rather lax, the flowering peduncles about 3 mm. long, the pedicels 3–4 mm. long. Flowers hermaphrodite, the buds broadly oblongoid, 5–7 mm. long slightly before anthesis, the apical appendages short, about 1 mm. long or less; sepals lanceolate, 7–8 mm. long including the apical appendages, lightly stellate-pubescent without; petals broadly obovate, 5–6



mm. long and 2–3 mm. wide, the claw 2–3 mm. long, densely plumose; gonophore very short, less than 0.5 mm. long, the glands oblong, small; urceolus rather short, about 0.25 mm. high, distinctly 5-lobed, briefly ciliate; stamens 15, the filaments glabrous, smooth; ovary orbicular, about 1 mm. long, the spinules numerous, recurved, the style 4–5 mm. long, the stigma acute. Fruits orbicular, small, loosely borne in small nodose clusters, the body 2–3 mm. in diameter at maturity, lightly stellate-pubescent, 3-loculate, each cell 1-seeded, the spines about 75–100, about 1 mm. long, glabrous; seeds ovoid, 1.5–2.0 mm. long and 1.0–1.5 mm. wide.

Known only from the type.

MEXICO: OAXACA: Chivela, Bossé 8019 (FM).

39. TRIUMFETTA BARTRAMIA L. Syst. ed. 10. 1044. 1759. (Based on *Bartramia indica*).<sup>35</sup>

*Bartramia indica* L. Sp. Pl. ed. 1. 389. 1753. (T.: specimen from Hermann's Herb. now in Herb. Mus. Brit.).

*Triumfetta rhomboidea* Jacq. Select. Stirp. Amer. Hist. 147. 1763.

*Triumfetta rhombeaefolia* Sw. Prod. Veg. Ind. Occ. 76. 1788. (T.: Swartz s. n. in Herb. Riksmuseet, Stockholm).

*Triumfetta angulata* Lam. Encyc. Meth. 3:421. 1789.

*Triumfetta eriocarpa* St. Hil. Fl. Bras. Merid. 1:224. 1825. (T.: Gaudichaud s. n. in Herb. Paris.).

*Triumfetta Lappula* Vell. Fl. Flum. 5:t. 5. 1827, non L.

*Triumfetta Martiana* Turcz. in Bull. Soc. Nat. Moscou 31<sup>1</sup>:228. 1858. (T.: Martius 1263).

*Triumfetta semitriloba* var. *Martiana* K. Schum. in Mart. Fl. Bras. 12<sup>3</sup>:135. 1886, in part. (T.: Martius 1263).

*Triumfetta rhomboidea* var. *Spruceana* K. Schum. loc. cit. 133. 1886. (T.: Blanchet 188).

*Triumfetta excisa* Urb. Symb. Ant. 5:413. 1908. (T.: Sintenis 17c).

*Triumfetta rhomboidea* var. *recifensis* Monteiro, in Lilloa 3:247. 1938. (T.: Monteiro 218b).

Tall perennial shrubs 1–3 m. high; older branches reddish-brown, glabrous, rough, longitudinally ridged, punctate with prominent white lenticels, the younger ones and inflorescence axes terete or with very shallow longitudinal ridges, scurfy, clothed with short dense rough stellate tomentum. Leaves typically broadly ovate to rhombic-ovate, obscurely or distinctly 3-lobed, often rather deeply dissected into 3 to 5 lobes, usually 4–5 cm. long and nearly as broad, sometimes 7–8 cm. long and 6–7 cm. wide, obtuse or rounded at the base, abruptly acuminate, the serrations irregular, blunt, rarely glandular near the basal sinus, both surfaces nearly glabrate with few scattered, short, coarse, stellate hairs; petioles slender, 3–5 cm. long, briefly stellate-tomentose, scurfy. Inflorescences axillary, the cymes of 3–5 cymules, condensed in dense nodose clusters, the bracts narrowly ovate, petioles usually about 1 cm. long, the flowering peduncles 1–2 mm. long, the pedicels about 1 mm. long. Flowers hermaphrodite, the younger buds obovoid with very deeply cucullate sepals, the older ones oblongoid, the apex more expanded than the base or the middle, 5–7 mm. long slightly before anthesis, lightly stellate-

<sup>35</sup>The identity of this species is based on the interpretation of Fawcett & Rendle in Jour. Bot. 59:224. 1921.



pubescent to glabrescent without, brownish and glabrescent within; petals yellow to brown, broadly obovate, about 5 mm. long and 2–3 mm. wide, the claw 1–2 mm. long, densely plumose; gonophore very short, less than 0.5 mm. long, the glands oblong, very small; urceolus short, deeply many-lobed, briefly ciliate; stamens 10–15, the filaments glabrous with 4–6 rows of retrorse serrations; ovary orbicular, about 1 mm. long, the spinules numerous, recurved, the style 5–6 mm. long, the stigma acute. Fruits small, orbicular, in dense nodose clusters, the body about 3–4 mm. in diameter at maturity, densely cinereous-tomentose, 3-loculate, each cell 1-seeded, the spines numerous, 75–100, about 1.0–1.5 mm. long, glabrous or nearly so; seeds ovoid, about 1.5 mm. long and 1.0–1.5 mm. wide.

A common weedy species of lowland tropics of both hemispheres, but apparently very rare on the continent of North America. Found in Florida and British Honduras where introduced. Flowers and fruits from July to November.

The small round fruits with dense cinereous tomentum between the short glabrous spines and the younger floral buds with very deeply cucullate sepals are constant characters throughout its wide range.

U. S. A.: FLORIDA: Sumter Co., Webster, *Curtiss 6738* (Mo).

BRITISH HONDURAS: Stann Creek, *Schipp 833* (Mo).

JAMAICA: *Swartz s. n.* (S).

HAITI: presqu'île du Nord-ouest, *Ekman H9663* (S).

DOMINICAN REPUBLIC: Moncion, Prov. Monte Cristi, alt. 375 m., *Valeur 411* (NY, S),

PUERTO RICO: prope Mayaguez ad Guanajibo, *Sintenis 17* (C, S), *17c* (S); Coamo, *Sintenis 3134* (S).

VIRGIN ISLANDS: SAINT THOMAS: *Holton s. n.* (NY). SAINT CROIX: *Ricksecker 136b* (FM); Bassin yard, *Ricksecker s. n.* (NY); *Benzon 214* (C).

MARTINIQUE: *Duss 1364* (Mo); *Sieber 130* (Mo).

TOBAGO: Highmoor, *Broadway 3092* (Mo, S, U); near Frenchfield, *Egger 5633* (S); Dist. Les Coteaux, *Broadway 9071* (Mo).

TRINIDAD: Icacos, R. O. *Williams 10840* (TRIN); *Sieber 150* (G, Mo).

COLOMBIA: MAGDALENA: Santa Marta, Minca, *Engstedt 61* (S).

VENEZUELA: BOLIVAR: Ciudad Bolivar, alt. 35 m., *Holt & Gebriger 158* (US).

FRENCH GUIANA: vicinity of Cayenne, *Broadway 559* (US).

BRAZIL: AMAZONAS: Rio Negro, *Ule 8916* (S, US). BAHIA: Corcovado, antigua estrada, *Glaziou 1148* (BR, C, R); Andaarahy, porto de Tijuca, *Glaziou 8274* (R); vicinity Bahia, *Rose & Russell 19638* (NY, US), *Blanchet 188, 410* (G), *1285B* (BR, P), *s. n.* (Mo); exact locality lacking, *Salzmann 76* (G), *Martius 1263* (BR, G, NY), *1265* (BR); *Glocker 1* (US). DISTRITO FEDERAL: Ilha de Taboinha, Guanabara, *Vidal s. n.* (R); exact locality lacking, *Lutz s. n.* (R); *Lima s. n.* (R). GOYAZ: Porto Imperial, *Burchell 8747* (BR). MATO GROSSO: Santa Anna da Chapadas, *Malme 3407* (S). MINAS GERAIS: Jard. Bot. Belo Horizonte, *Barreto 7925* (R); Fazenda da Chicaca, Munic. Santa Luzia, alt. 1100 m., *Assis 69* (US). PARÁ: Boa Vista on the Tapajoz River, *da Costa 151* (US). PERNAMBUCO: Tapéra, *Pickel 3278* (US). RIO DE JANEIRO: Lünd ad Rio de Janeiro, *Warming 1270* (C); Engenhoça, *Warming 1241, 1255, 1259* (C); Atafona, *Sampaio 8142, 8991, s. n.* (R); estrada de Rodagem, Mericá, *Vidal s. n.* (R); Campo Bello, Carrapicho, *Sampaio 4624* (R); Vermelha, *da Costa 50114* (R); Campos, *Sampaio 50117* (R); Caxias, *Passarelli s. n.* (R); prope Rio, *Luschnath s. n.* (S); environs de Rio Janeiro, *Wedel s. n.* (BR); montagne des Orgues, alt. 800 m., *Wagner s. n.* (BR); prope Río-Janeiro, *Burchell 2939* (BR, P); exact locality lacking, *Houllet s. n.* (BR); *Meyen s. n.* (BR); *Lehmann s. n.* (BR); *Burchell 1043* (BR); *Glaziou 667, s. n.* (BR); *Anderson s. n.* (S); *Dusén 77* (S); *Valentin s. n.* (S); *Gartner 14* (US). SÃO PAULO: Campinas, *Heiner s. n.* (S); Santos, *Valentin s. n.* (S). DATA INCOMPLETE: *Alfont s. n.* (S);



*Blanchet s. n.* (G); *Cordoso s. n.* (R); *Gaudichaud s. n.* (P); *Kiedel 108, 110* (C, S); *Poblius s. n.* (BR); *St. Hilaire s. n.* (BR); *Widgren 534* (S).

PERU: LORETO: Iquitos, alt. 100 m., *Killip & Smith 27229* (US); Punchana, near Iquitos, *L. Williams 1314* (US).

40. TRIUMFETTA SAMPAIOI Monteiro, in *Lilloa* 3:244. 1938. (T.: *da Costa 65A*).

Shrubs 1–2 m. high; branches and inflorescence axes terete, with few long, stellate and simple hairs. Leaves broadly ovate to deeply 3-lobed, about 9 cm. long and 3 cm. wide, the base cuneate to obtuse, the tip gradually and narrowly acuminate, regularly and doubly serrate, both surfaces with few long, stellate and simple hairs, especially on the veins; petioles about 3 cm. long, densely clothed with long hairs. Inflorescences axillary, the cymes of 4 cymules, condensed in the axils of the bracts, the flowering peduncles about 4 mm. long, the pedicels 1–2 mm. long. Flowers hermaphrodite, the buds oblongoid, small, about 3 mm. long slightly before anthesis, apical appendages prominent though short; sepals oblong, deeply cucullate in younger buds, about 3.5 mm. long, pilose without, glabrescent within; petals narrowly obovate, subequalling the sepals, the claw about 1.5 mm. long, very lightly plumose; gonophore about 0.75 mm. long, the glands quadrangular, small; urceolus absent; stamens 5, the filaments with 4 rows of retrorse serrations, pubescent at the base; ovary orbicular, about 1 mm. long, the spinules about 50, recurved, the style 3–4 mm. long, the stigma very briefly 3-parted. Fruit suborbicular, small, in dense nodose clusters, the body about 3 mm. in diameter at maturity, rather densely long-tomentose, 3-loculate, each cell 1-seeded, the spines 30–50, about 1 mm. long, plumose; seeds pyriform, small.

Known only from northeastern Brazil; flowering and fruiting from March to June.

BRAZIL: CEARA: Maracanahú, Est. Exp. de Pl. Texteis em S. Antonio, *Rodriguez 26* (R); Crato in Caapuerao, *Löfgren 619* (S); exact locality lacking, *Rocha 25* (R). MARANHÃO: Island of São Luiz, *Fröes 11884* (US). PARA: Río Murucutu, Belem, *da Costa 65A* (R); Belem, Carrapicho, *Silva s. n.* (US).

This species is very closely related to *T. Bartramia*, and the superficial resemblance is rather striking. However, the absence of the urceolus, the presence of only 5 stamens, and the plumose spines differentiate it sufficiently.

41. TRIUMFETTA PANICULATA Hook. & Arn. Bot. Beechey Voy. 279. 1841. (T.: *Beechey Herb. s. n.* in Herb. Kew.).

*Heliocarpus tigrinus* Hochr. in Ann. Conserv. Jard. Bot. Genève 18:123. 1914. (T.: *Langlassé 708*).

*Triumfetta tigrina* (Hochr.) Standl. in Contr. U. S. Nat. Herb. 23:1674. 1926.

*Triumfetta leiocarpa* Standl. in Field Mus. Publ. Bot. 11:167. 1936. (T.: *Emrick 130*).

*Triumfetta Matudai* Lundell, in Contr. Univ. Mich. Herb. 7:27. 1942. (T.: *Matuda 2148*).

Small trees or shrubs 3–5 m. high; older branches glabrous, generally angled with decurrent petiole bases, the younger stems and inflorescence axes longitudinally ridged, clothed with short separate tufts of stellate hairs. Leaves broadly ovate, profoundly 3- to 5-lobed, about 15–18 cm. long and 16–20



cm. wide, lightly pubescent, usually scabrous, the veins densely tomentose; petioles 4–7 cm. long, coarsely stellate-pubescent. Inflorescences terminal, the cymes of 3–5 cymules, usually in dense nodose clusters, the flowering peduncles 3–5 mm. long, the pedicels 2–5 mm. long. Flowers hermaphrodite, the buds obovoid, 5–7 mm. long and about 3 mm. wide slightly before anthesis, constricted towards the base, the apical appendages short, nearly obsolete; sepals obovate, about 6 mm. long, with short rough stellate hairs without, glabrescent within; petals linear, yellow to brown, 3–4 mm. long, the claw about 1 mm. long, densely plumose; gonophore short, about 0.5 mm. long, the glands spherical to slightly elliptical, small; urceolus short, 0.25–0.50 mm. high, many-lobed, lightly ciliate; stamens 30–40, the filaments glabrous, smooth; ovary orbicular, about 1.5 mm. long, the spinules numerous, recurved, the style 2–3 mm. long, the stigma briefly 2-parted. Fruit globose, large, the body about 6 mm. in diameter at maturity, glabrous, 2-loculate, each cell 2-seeded, later falsely 4-celled, each with 1 seed, the spines numerous, glabrous, 3–5 mm. long; seeds ovoid, 2–3 mm. long and 1.5–2.5 mm. wide.

Western Mexico, usually growing in oak forests at altitudes of about 500 m.; flowering and fruiting from September to early December.

MEXICO: CHIAPAS: Escuintla, *Matuda 2148* (FM, MICH, NY). COLIMA: Coahuayana, *Emrick 130* (FM). GUERRERO: La Morena, alt. 450 m., *Langlassé 708* (G, GH); Vallecitos, Montes de Oca, *Hinton 11602* (GH). JALISCO: exact locality lacking, *Beechey Herb. s. n.* (K). SINALOA: Quebrado de Mansana, Sierra Surotato, alt. 4000–4500 ft., *Gentry 6507* (Mo); in the foothills of Sierra Madre, *Rose 1768* (US); San Ignacio, San Juan, *Ortega 6880* (FM); exact locality lacking, *Ortega 4768* (US).

Hooker and Arnott gave only a brief description of the spines and referred to three rather brief diagnoses by Schlechtendal<sup>36</sup> for the descriptions of the flowers and the habit. Schlechtendal's descriptions were based on plants collected by Schiede and Deppe. None of the descriptions are adequate, and because of this, *T. paniculata* has been little known in the herbarium. The decurrent petiole bases on the stems, the large, usually 3- to 5-lobed glabrous leaves, the small obovoid floral buds, and the relatively large glabrate fruits, characterize this species. The ebracteolate, terminal inflorescence tends to confuse this species with the genus *Heliocarpus*.

42. TRIUMFETTA GALEOTTIANA Turcz. in Bull. Soc. Nat. Moscou 32<sup>1</sup>:260. 1859. (T.: *Galeotti 4153*).

*Triumfetta apetala* Hochr. in Ann. Conserv. Jard. Bot. Genève 18:97. 1914. (T.: *Galeotti 4152*).

Shrubs 2–3 m. high; branches and inflorescence axes scurfy, coarsely stellate-tomentose. Leaves broadly ovate to 3-lobed, 7–12 cm. long and 4–8 cm. wide, sometimes slightly larger, the base rounded or subcordate, the tip gradually and narrowly acuminate, the serrations irregular, acute, the basal ones generally glandular, both surfaces scabrous, clothed lightly with many short tufts of stellate hairs,

<sup>36</sup>Schlecht. in *Linnaea* 5:288. 1830; 6:424. 1831; 11:376. 1836.



Fig. 13. *Triumfetta Galeottiana*

the veins densely tomentose; petioles 3–5 cm. long, coarsely stellate-pubescent. Inflorescences gynodioecious, axillary, rarely terminal, hermaphrodite, large and spreading, the cymes of 3–5 cymules, usually in dense nodose clusters, the flowering peduncles 3–5 mm. long, the pedicels 2–4 mm. long, the buds obovoid, 5–7 mm. long and about 3 mm. wide slightly before anthesis, constricted towards the base, the apical appendages short, nearly obsolete, the sepals obovate, about 6 mm. long, with short rough stellate hairs without, glabrescent within, the petals linear, yellow to brown, 3–4 mm. long, the claw about 1.5 mm. long, densely plumose,



the gonophore slender, 1.0–1.5 mm. long and about 0.75 mm. wide, the glands oblong, prominent, the urceolus about 0.5 mm. high, many-lobed, densely ciliate, the stamens 20–30, the filaments retrorsely 2-serrate, the ovary ovoid, about 1 mm. long, the spinules about 50, recurved, the style less than twice the length of the ovary, the stigma very briefly 3-parted; pistillate inflorescence of the same general nature and size as the hermaphroditic one, the buds oblongoid, about 3–4 mm. long slightly before anthesis, the apical appendages nearly obsolete, the sepals 3–5 mm. long, with short separate tufts of stellate hairs without, glabrescent within, the petals absent, the gonophore elongate, about 1.5 mm. long, the glands oblong, prominent, the urceolus about 0.5 mm. high, many-lobed, densely ciliate, the staminodes 15–20, about 2 mm. long, the ovary orbicular, the spinules about 50, the style about twice the length of the ovary, the stigma very briefly 3-parted. Fruit globose or subglobose, the body glabrous, 3–4 mm. in diameter at maturity, 3-loculate, each cell 1-seeded, the spines 30–40, each 3–4 mm. long, straight, glabrous; seeds pyriform, 1.5–2.0 mm. long and about 1.5 mm. wide.

Southern Mexico, in dry sunny places at altitudes of 500 to 2000 m.; flowering in September and October, the fruit maturing from late October to middle of December.

MEXICO: GUERRERO: Mancho, Mina, alt. 1200 m., *Hinton* 9641, 9642, 9643, 9644, 9670 (GH); Zihuagio, Mina, alt. 1100 m., *Hinton* 9720 (GH); Río Frio, Mina, alt. 1300 m., *Hinton* 10717 (Mo, US), 10718 (GH); Pilas, Mina, alt. 1600 m., *Hinton* 10744 (US); Carrizo-Sto. Domingo, Galeana, alt. 1200 m., *Hinton* 14371, 14638 (GH); between Petatlan and Chilapa, alt. 5000–6500 ft., *Nelson* 2155 (US); San Geronimo, *Altamirano* 659 (US). JALISCO: near Etzatlan, *Rose & Painter* 7520 (NY, US); between Atequiza and Chapala, *Rose & Painter* 7609 (US). MÉXICO: Distr. Temascaltepec: Carboneras, alt. 2000 m., *Hinton* 1857 (Mo), 5077, 6827 (US); Ixtapan, alt. 1000 m., *Hinton* 2278 (US); Nanchititla, *Hinton* 5249 (US); Las Mesas, 6415, 6784 (Mo, US); Tejupiko, *Hinton* 6777 (Mo). MICHOACAN: vicinity of Morelia: Coronilla, alt. 1900 m., *Arsène* 2540 (Mo, US); Loma Sta. Maria, alt. 1950 m., *Arsène* 2978 (GH, Mo, US), 5879 (GH, Mo, NY, US), 7281 (US); Coalcomán, Salitro-Mesa, alt. 1800 m., *Hinton* 12484, 12485 (US); Zitacuaro, alt. 1400 m., *Hinton* 13340 (GH, Mo); south of Torricillas, *Hinton* 15281 (GH, US); Tancitaro, Uruapan, *Hinton* 15681 (GH). NAYARIT: road from Tepic to Los Aguacates, alt. 1000 m., *Mexia* 583a (US); trail from Tepic to Santiago, alt. 1000 m., *Mexia* 639 (Mo, US). OAXACA: Cerro de San Felipe, 1900 m., *Conzatti* 453 (US), 1617 (NY, US); Valley of Etna, *Alvarez* 728 (GH, US); Zinatlan, alt. 1925 m., *Conzatti & Velde* 4676 (BR); exact locality lacking, *Moricand s. n.* (G). SINALOA: Las Mesas, Sierra Surotato, alt. 3000 ft., *Gentry* 6142 (Mo); Quebrado de Mansana, Sierra Surotato, alt. 4000–5000 ft., *Gentry* 6454, 6454a, 6454b, 6454c, 6561 (Mo). VERA CRUZ: Zacuapan, Cordillera, alt. 3000 ft., *Galeotti* 4152 (BR), 4153 (BR, G, US); Orizaba, *Botteri s. n.* (GH), 765 (G, P), 988 (P), 1110 (GH, US); above Orizaba, *Smyth* 162 (US); *Müller s. n.*, 543 (NY), 148 (BR, NY); Zacuapan and vicinity, Barranca de Tenampa, *Purpus* 2109, 3661 (Mo, US), 3058 (Mo, NY, UC, US); Mirador, *Liebmann* 532 (US); Totutla, *Liebmann* 509 (US). DATA INCOMPLETE: *Mobr s. n.* (US); *Linden Suppl.* 47 (BR).

*Triumfetta apetala* has been treated thus far as a distinct species. I am convinced that it is the pistillate form of *T. Galeottiana*, as the younger fruiting specimens can be assigned to *T. Galeottiana* despite the fact that they have apetalous, pistillate flowers. I do not know of any mature fruiting specimen that could be included in *T. apetala* in opposition to *T. Galeottiana*.



43. *TRIUMFETTA HELIOCARPOIDES* Bullock, in Kew Bull. 293. 1937. (T.: *Hinton 5159*).

Small shrubs 1.0–1.5 m. high; branches and inflorescence axes minutely stellate-tomentose. Leaves broadly ovate, usually 3-lobed, 10–15 cm. long and 7–9 cm. wide, the base subcordate to rounded, the tip gradually and narrowly acuminate, rather regularly and doubly serrate, the upper surface green, scabrous, very lightly pubescent with minute tufts of stellate hairs, the lower pallid, slightly more pubescent with prominent veins and veinlets; petioles long and slender, 5–10 cm. long, with short separate tufts of stellate hairs. Inflorescences gynodioecious, pistillate terminal, the cymes of 4–6 cymules, condensed in dense nodose clusters, the flowering peduncles 3–4 mm. long, the pedicels about 2 mm. long; flowers small, the bud about 3 mm. long slightly before anthesis, the apical appendages prominent though short; sepals oblong, 3–4 mm. long, densely but minutely tomentose without, glabrescent within; petals obovate, very small, only about 1 mm. long, the claw lightly plumose; gonophore 0.5–0.75 mm. long, the glands oblong, small, with ciliate upper margins; urceolus short, many-lobed, distinctly ciliate; staminodes 10, about 2 mm. long; ovary orbicular, the spinules about 25, recurved, the style about 1.5 mm. long, the stigma briefly 2-fid; hermaphroditic inflorescence not seen. Fruit orbicular, the body about 2 mm. in diameter at maturity, dark brown to black, glabrous, 3-loculate, usually 1 cell aborted, each 1-seeded, the spines 20–25, glabrous, 3–4 mm. long; seeds pyriform, small.

Known only from the state of México, usually growing at an altitude of about 1000 m.; flowering and fruiting from October to November.

MEXICO: MÉXICO: Ixtapan, Temascaltepec, alt. 1000 m., *Hinton 5159* (K, NY), *7001* (GH, K); Tejupilco, *Hinton 6779, 6780* (K).

#### DOUBTFUL SPECIES

1. *TRIUMFETTA CALYCINA* Turcz. in Bull. Soc. Nat. Moscou 36<sup>1</sup>:574. 1863. (T.: Peru, *Mathews 889*).

A large-flowered species allied either to *T. speciosa* or *T. mollissima*. I have not seen the type, but the description fits *T. multilocularis*, except for the fact that *T. calycina* reportedly has only 15–16 stamens, whereas *T. mollissima* has 25–30.

2. *TRIUMFETTA JELSKII* Szysz. in Rozpr. Akad. Umiejet. [Krakow], Mat.-przy. II, 9:224. 1895. (T.: Tambillo, Peru, *Jelski 280*).

A species allied to *T. caudata* according to the description. I have not seen the type and the description is inadequate for diagnosis.

3. *TRIUMFETTA BRACHYPETALA* Urb. & Ekm. in Arkiv f. Bot. 23A<sup>5</sup>:80. 1930. (T.: Haiti, *Ekman H. 9462*).

A hybrid species between *T. Lappula* and *T. semitriloba*. I have not seen the type, and the very short description is inadequate for diagnosis.



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*Italicized numerals refer to collector's number, s. n. (sine numero) to unnumbered collections; parenthetical numerals refer to the numerals of taxonomic entities conserved in this monograph.*

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